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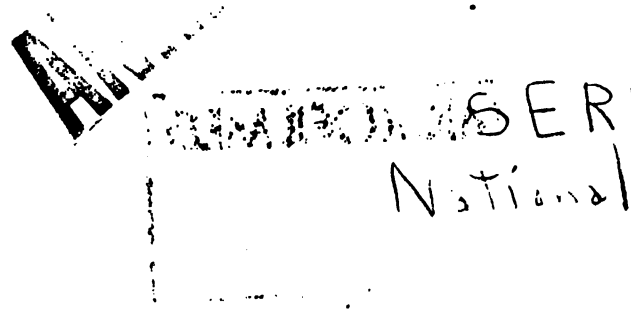
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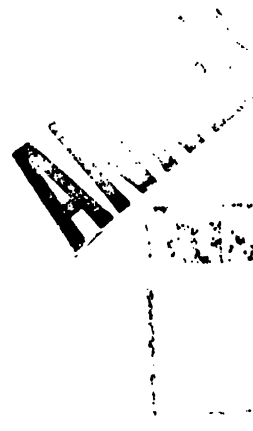
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See criticism of this report in:
Municipal Journal (London) v. 16, p. 648, 671, 712.
v. 17, p. 63.

Municipal and Private Operation of Public Utilities

VOLUME I

Municipal and Private Operation of Public Utilities

REPORT TO THE

NATIONAL CIVIC FEDERATION

Commission on Public Ownership and Operation

IN THREE VOLUMES

PART I—VOLUME I

GENERAL CONCLUSIONS AND REPORTS

NEW YORK CITY
NATIONAL CIVIC FEDERATION, 281 Fourth Avenue
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Dr. MILO R. MALTBIE acted in Professor Parsons' place during his illness.

Mr. J. W. SULLIVAN acted in Mr. Edgar's place during his absence.

PREFATORY NOTE

This Report to the National Civic Federation Commission on Public Ownership and Operation has been prepared in pursuance of a resolution adopted October 5, 1905, when the Committee on Investigation was appointed and instructed to make a thorough and comprehensive examination into the subject, and to prepare a full report of its findings for consideration and discussion. The first of the three volumes—Part I., Volume I.—contains the final conclusions of the Committee and the general summaries of the evidence upon the various phases of the subject. The second volume —Part II., Volume I.—is devoted to the reports of the experts upon conditions in the United States. The third volume—Part II., Volume II.—is devoted similarly to the situation in Great Britain—the European country selected for investigation.

ERRATA

The following errors have been noted as the volume was passing through the press:

Page 127, line 29 from the top:
"Does" should read "did."

Page 127, line 5 from the bottom:
"Only 8" should read "only 9."

Page 127, lines 3 and 4 from the bottom:
"Denver" should be added to this list of cities.

Page 128, line 5 from the top:
"30" should read "29."

Page 128, line 6 from the top:
"14,909,071" should read "14,786,550."

Page 128, line 7 from the top:
"16,553,850" should read "16,426,929."

Page 135, line 2 from top of table should read:
"Cleveland ..... 65,766 $171,200.00 $2.60"

Page 169, line 5 from the top:
After "examined" insert "in this country."

Page 169, line 5 from the bottom:
Omit "agreed upon."

Page 172, line 15 below the table:
"Indeterminate" should read "intermediate."

Page 177, line 16 from the bottom:
"Exclude it" should read "exclude interest."

Page 185, line 5 from the top:
"Benefit of" should read "evidence of."

Page 185, line 13 from the top:
"From" should read "by."

Page 185, "of" should be omitted from chief line of subhead.

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INTRODUCTION.

By EDWARD A. MOFFETT.

Until the National Civic Federation took up the question, no definite effort had been made to determine impartially and scientifically the relative merits of private and public ownership and operation of public utilities. A basis upon which to found discussion and conclusions for the guidance of future policy respecting this growing question was wanting. As to what measure of success had attended municipal ownership and operation in any particular instance, there was the widest divergence of opinion. Those who believed in public ownership and operation confidently asserted that the adoption of their ideas would greatly promote the purity of American civic conditions and advance the welfare of the people. This the believers in private ownership and operation as stoutly denied.

When, in September, 1905, the announcement was made by the National Civic Federation that it would undertake an investigation of the question in the United States and Europe, men prominently identified with both sides of this great subject came forward and volunteered their services. Public service corporations and leading advocates of municipal ownership showed equal desire to have the question disassociated from the many false ideas with which it had been surrounded.

A commission having a membership of one hundred and fifty men widely known as publicists, corporation chiefs and leaders of labor was formed. This representative body, known as the Commission on Public Ownership and Operation, held its first meeting at Columbia University, New York, on October 5, 1905. Officers were chosen, also an Executive Committee, and a Committee on Investigation (see preceeding pages for names). This last-named committee was charged with the duty of making the actual investigation, with authority to engage the requisite professional assistance. In order to insure the greatest possible degree of impartiality, this committee was formed of persons, about equally divided into three groups, those regarded as "pros," those as "antis," and those who were classified as having taken no pronounced position whatever.

(This committee observed the same rule in the selection of its sub-committees.) The scope of the investigation was also indicated, it being understood that the details of the same should be developed by the committee. Practically unanimous was the sentiment, that inasmuch as political and other conditions in the United Kingdom were more nearly comparable to similar conditions in the United States than were those in other European countries, therefore the investigation abroad should be limited to Great Britain and Ireland.

The public utilities decided upon for investigation, as conducted by private companies and by municipalities, were GAS, ELECTRIC LIGHTING AND POWER, WATER, and STREET RAILWAYS.*

Immediately after the adjournment of the Commission, the Committee on Investigation, otherwise known as the Committee of Twenty-one, held its initial meeting, the Hon. M. E. Ingalls presiding. A committee, known as the Sub-Committee of Five, was appointed to prepare a scheme of investigation and procedure and to supervise the work when the full committee was not in session.

A comprehensive scheme of investigation prepared by the Committee of Five was reported to the Committee of Twenty-one at its second meeting, November 27, 1905. With certain amendments, the report was adopted unanimously. In brief the plan provided:

(1) The particular public utilities to be investigated in this country and Europe, namely, GAS, ELECTRIC LIGHTING AND POWER, STREET RAILWAYS, AND WATER, whether privately or publicly owned, to be considered in their broad relations to the municipality, the consumer and the citizen generally.

(2) An investigation to proceed along the following definite lines:

1. Franchises of Private Companies;
2. Public Supervision by Governmental Authorities;

* The investigation of street railways was confined to the United Kingdom, for the reason that in the United States there was none under public operation. The investigation of water works was restricted to the United States because the number of *municipal* water works was so large, and because the long period for which they had been operated insured a great amount of data. It was believed also that by confining the foreign investigation to Gas, Electric Lighting and Power, and Street Railways, public utilities that had been municipalized to a far greater extent than they had been in this country, it would be more conducive to the purpose of the investigation.

3. History of Municipal Ownership;
4. Effect of Public and Private management upon;
   (a) Political conditions,
   (b) Conditions of labor,
   (c) Character of service,
   (d) Price of service,
   (e) Cost of service,
   (f) Economy of management,
   (g) Improvement in service and methods,
   (h) Financial results, etc.

(3) The selection of a number of public and private plants for examination.

(4) The appointment of experts to report upon the various topics above named, and any others which might have in their judgment a bearing upon the question of municipal ownership.

At the next meeting of the Committee of Twenty-one upon January 10, 1906, the committee submitted a full report upon the plan and scope of the investigation in the United States, which was approved. It was then authorized to employ experts for the execution of the plan adopted and to arrange for a similar investigation in Europe.

Following this, schedules containing the questions to be answered for each undertaking were prepared, experts were selected to investigate the various subjects and the actual work begun. As a further effort that the investigation might be as impartial as possible, and that the technical reports submitted to the committee might be accepted by all, it was decided to appoint one expert nominated by the "pros" and one by the "antis;" these two to work side by side and prepare a joint report. In a few instances where both "pros" and "antis" could agree upon a single expert, two were not named. The apportionment of the work of expert investigation in the United States was as follows:

Professor John H. Gray, general history, franchises, legislation and public supervision—Schedule I—all undertakings;

Professor John R. Commons and Mr. J. W. Sullivan, labor and politics—Schedule II—all undertakings;

Mr. Dabney H. Maury, engineering aspects—Schedule III—all water works;

Mr. Alfred E. Forstall and Mr. Frederick Burnett, engineering aspects—Schedule III—all gas works;

Mr. Charles E. Phelps, Jr. and Mr. Theodore Stebbins, engineering aspects—Schedule III—all electric lighting plants outside of Massachusetts;

Messrs. Marwick, Mitchell & Co., financial matters—Schedule IV—all undertakings;

Mr. Charles E. Prichard and Mr. Alton D. Adams, electric lighting in Massachusetts—Schedules I, II, III and IV;

Professor Leo S. Rowe, the history of the municipal gas works of Philadelphia;

Mr. Walter L. Fischer, the municipal electric light plant of Chicago. This report was prepared by Mr. William Hard.

The undertakings chosen for investigation in the United States were those in the following cities:

GAS.

Public.	Private.
Wheeling, W. Va.	Atlanta, Ga.
Richmond, Va.	Norfolk, Va.
	Philadelphia, Pa.

WATER.

Public.	Private.
Cleveland, O.	New Haven, Conn.
Chicago, Ill.	Indianapolis, Ind.
Syracuse, N. Y.	Utica, N. Y.

ELECTRIC LIGHTING AND POWER.

Public.	Private.
Chicago, Ill.	Chicago, Ill.
Allegheny, Pa.	Pittsburgh, Pa.
South Norwalk, Conn.	Geneva, N. Y.
Detroit, Mich.	Toledo, Ohio.

MASSACHUSETTS ELECTRIC PLANTS.

Public.	Private.
Danvers.	Northamption.
Holyoke.	Fitchburg.
Westfield.	Salem.
Marblehead.	Beverly.
Peabody.	Gardner.
Taunton.	Abington and Rockland.
Chicopee.	Attleboro.
North Attleboro.	Uxbridge and Northbridge.

While the corps was taking the field in the United States and other preliminary work being undertaken, arrangements were also being made to initiate the work abroad. In February, Dr. Milo R. Maltbie sailed for London, where he was joined early in March by Mr. J. W. Sullivan. These members had been selected to direct the work of the engineers and accountants in the investigation to be made abroad.

In March, 1906, the Committee on Investigation took the field, following up the experts, who had by this time gotten well into their work. The first city visited by the committee was Wheeling, W. Va. As the experts progressed with their duties, visits were made by the committee to several of the American cities selected. This work of inspection continued until May of that year, when the committee sailed for Great Britain and Ireland.

The members who participated in the foreign investigation were Messrs. Ingalls, Goodnow, Walton Clark, Bemis, Maltbie, Parsons, Sullivan, Healy, McNulty, Winchester, Edgar, Commons, Gray, W. J. Clark, and Moffett. The committee at once proceeded upon its duties, so thoroughly had the two members to whom had been entrusted the work of preparing the way, performed their task.

In the division of the work the same principles were followed in Great Britain as in the United States, a joint report being prepared by two experts, one nominated by the "pros" and the other by the "antis," except in a few instances where one person was acceptable to both sides. The names of the experts and the apportionment of the field were as follows:

Dr. Milo R. Maltbie, general history, franchises, legislation and public supervision—Schedule I—all undertakings;

Professor John R. Commons and Mr. J. W. Sullivan, labor and politics—Schedule II—all undertakings;

Mr. William Newbigging, consulting engineer, Manchester; and Mr. J. B. Klumpp, inspecting engineer of the United Gas Improvement Co., Philadelphia; the engineering aspects—Schedule III—all gas works;

Mr. A. E. Winchester, of the South Norwalk Electric Lighting Plant and Mr. J. B. Klumpp, the engineering aspects—Schedule III—all electricity supply works;

Mr. Norman McD. Crawford, consulting engineer, Hartford; and Mr. J. H. Woodward, of Preece & Cardew, London; engineering aspects—Schedule III—all tramways;

Mr. R. C. James, accountant of the United Gas Improvement Company, Philadelphia; and Mr. E. H. Turner, of

Astbury, Turner & Co., chartered accountants, Manchester; financial matters—Schedule IV—all undertakings.

The undertakings selected for examination were as follows:

GAS.

Public.	Private.
Glasgow.	London: South Metropolitan Gas Co.
Manchester.	
Birmingham.	Newcastle and Gateshead.
Leicester.	Sheffield.

ELECTRIC LIGHTING AND POWER.

Public.	Private.
Glasgow.	Newcastle—Both companies.
Manchester.	London: Westminster Co.
London: Borough of St. Pancras.	St. James and Pall Mall Co.
	Central Co.
Liverpool.	City of London Co.

TRAMWAYS.

Public.	Private.
Glasgow.	Dublin.
Manchester.	Norwich.
Liverpool.	London: London United Tramways.
London: Southern System of the London County Council.	Bristol.

In its inspection of each plant visited, as was the procedure in America also, the committee was accompanied by the experts, and in this way many things that would otherwise have been overlooked were carefully noted. At the end of each day it was the practice to hold a meeting of the committee for the purpose of consulting with the experts regarding the particular plant visited that day.

In order that no dependable source of information should go unavailed of two hearings were held at London, before which appeared leading British advocates and opponents of municipal ownership, the proceedings of which, in condensed form, are given in these volumes. Among those who participated were the Rt. Hon. Lord Avebury, and the Hon. T. McKinnon Wood, Progressive Leader, London County Council. The proceedings of these hearings quite fully show how Municipal Trading is regarded in the United Kingdom, from opposite viewpoints. Conferences were also

had with the Rt. Hon. John Burns, Member of Parliament and President of the Local Government Board, with the officers of the London Board of Trade and other public officials and associations.

Great was the interest in the work of the committee. Municipalities and public service companies placed at the command of the investigators every facility for the promotion of their work. The press published each day the doings of the committee, and the metropolitan dailies editorially commented upon the enterprise and public spiritedness of the National Civic Federation in undertaking so great a work. At each city visited the committee was given a banquet, and, so far as its "crowded" itinerary would permit, other entertainment was generously provided.

In all, six months' time was consumed in making the foreign investigation.

Before leaving London the committee adopted a plan whereby the data gathered and yet to be gathered should be compiled in concise and convenient form in order to facilitate the preparation of its report; and which plan is briefly outlined here so that the relation of each of the several reports and articles appearing in these volumes, may be conveniently understood. The compilation was to be done by a sub-Committee of Four composed equally of members believed to represent opposite sides of the question of Municipal Ownership: Profs. Edward W. Bemis and Frank Parsons, and Messrs. Walton Clark and Charles L. Edgar.* Dr. Milo R. Maltbie was requested to prepare a history of Parliamentary action in relation to the municipal utilities under investigation; Prof. Frank J. Goodnow, a report on political conditions in the municipalities of the United Kingdom as compared with similar conditions in the cities of the United States, the same to include a discussion of the relation of such political conditions to public and private operation of the particular municipal utilities. Subsequently Mr. Walter L. Fisher was requested to prepare a similar report on American Municipalities.

The committee concluded its visits to American cities some time after its return from abroad, by making a tour of Cleveland, Detroit, and Philadelphia. In these cities, as in the case of the cities visited before the committee sailed for Europe, every courtesy

* Afterward a change became necessary in the personnel of this committee, owing to the fact that Prof. Parsons had been taken seriously ill and that Mr. Edgar could not spare the necessary time. Dr. Maltbie and M.'. Sullivan were chosen to fill the vacancies, but later Prof. Parsons and Mr. Edgar were able to return to the work.

was shown the investigators, and entertainment was provided them by public officials, heads of public service corporations, and various public bodies. When the experts had about finished their work of inspection, and the several sub-committees theirs of compilation, etc., a meeting was held in New York city, May, 1907. The primary object of this meeting was to ascertain to what extent the committee was in agreement. Such was the degree of unanimity manifested that within a few weeks another meeting—the final—was held in the same city. At this meeting a Majority Report, signed by nineteen members, was adopted. Subsequently a Minority Report was submitted by Mr. Walton Clark, President of the Franklin Institute and Third Vice-President of the United Gas Improvement Company.

These reports and all the matter spoken of, including the extensive data gathered by the corps of engineers and accountants, will be found in these volumes. Taken in the aggregate, this published matter represents a full two years of labor, and the expenditure of considerable money. If this investigation will have thrown any light upon the question with which it has dealt, those who gave unselfishly of their time and those who as unselfishly gave of their means, will have cause to feel amply repaid for their hearty co-operation.

REPORT TO THE NATIONAL CIVIC FEDERATION COMMISSION ON PUBLIC OWNERSHIP AND OPERATION

Your Committee on Investigation beg to report as follows:

After our appointment on October 5, 1905, we met and appointed a sub-committee to prepare a plan of procedure and investigation. It was decided that the Committee should visit a number of undertakings in certain American cities, and then should go abroad and make a similar investigation in certain cities in Great Britain, comparing the methods and results of municipal and private ownership. Much attention was given to the investigation in Great Britain, because it was felt that the American public was not so familiar with conditions abroad as at home, and because in the contests that have been waged for public ownership, allusion has always been made and prominence given to conditions in British cities.

Your Committee decided to employ both company and municipal men as experts, so that when investigating a gas plant, for example, there should be ordinarily one expert who had been employed by a private gas company and another to act with him, who had been employed by a municipality. A long series of questions was prepared and various special reports were called for, some from the members of the Committee who were detailed for this purpose and some from outside experts employed to investigate specific matters. All of these reports and schedules have been carefully prepared and are published herewith. While it may appear upon a superficial glance that there is too much of this work, we trust it will be appreciated by the student and by those particularly interested, and that these statistics and reports will do great good in the future as works of reference upon this important subject.

We wish here, at the beginning of our report, to tender our sincere thanks to the gentlemen in charge of the public utilities in the cities we visited in the United States and Great Britain for their polite attention and thoughtful consideration. Nothing could have been fairer or kinder than the treatment that they gave us. We examined their plants; we asked for detailed reports upon a long list of matters, which were cheerfully given. Whatever may be our opinion of the merits of municipal or private ownership, we are unanimous that no more courteous treatment could have been accorded anyone.

It is difficult to give positive answers of universal application to the questions arising as to the success or failure of municipal ownership as compared with private ownership. The local conditions affecting particular plants are in many cases so peculiar as to make a satisfactory comparison impossible, and it is very difficult to estimate the allowance that should be made for these local conditions. For instance, in making deductions from the financial conditions of Wheeling, as affected by its gas plant, as compared with those of Atlanta and Norfolk with their private plants, allowance must be made for the presence of natural gas in Wheeling. Again, in comparing the public water works of Syracuse with the private water works of Indianapolis from the point of view of the success or failure of municipal operation, geographical conditions must be taken into consideration. The situation at Syracuse is extremely favorable to the establishment of an efficient plant with comparatively little effort on the part of its management. At Indianapolis the conditions are unfavorable. In Syracuse the water flows to the city by gravity; in Indianapolis it must be pumped. So we might go through the various cities here and abroad that have been visited and show that the results were affected favorably or unfavorably by special conditions applicable to each city.

Further, the difficulty of reaching satisfactory results by the comparative method is not confined to special or local conditions. It is true, as well, of much broader questions. Thus any attempt to compare municipal with private electric light plants in the United States would be fruitless if allowance were not made for

We are also of the opinion that all future grants to private companies for the construction and operation of public utilities should be terminable after a certain fixed period, and that meanwhile cities should have the right to purchase the property for operation, lease or sale, paying its fair value.

To carry out these recommendations effectively and to protect the rights of the people, we recommend that the various states should give to their municipalities the authority, upon popular vote under reasonable regulations, to build and operate public utilities, or to build and lease the same, or to take over works already constructed. In no other way can the people be put upon a fair trading basis and obtain from the individual companies such rights as they ought to have. We believe that this provision will tend to make it to the enlightened self-interest of the public utility companies to furnish adequate service upon fair terms, and to this extent will tend to render it unnecessary for the public to take over the existing utilities or to acquire new ones.

Furthermore, we recommend that provision be made for a competent public authority, with power to require for all public utilities a uniform system of records and accounts, giving all financial data and all information concerning the quality of service and the cost thereof, which data shall be published and distributed to the public like other official reports; and also that no stock or bonds for public utilities shall be issued without the approval of some competent public authority.

We also recommend the consideration of the "sliding scale," which has proved successful in some cases in England with reference to gas and has been adopted in Boston. By this plan the authorized capitalization is settled by official investigation, and a standard rate of dividend is fixed, which may be increased only when the price of gas has been reduced. The subway contracts and their operation in Boston and New York are also entitled to full consideration.

In case the management of public utilities is left with private companies, the public should retain in all cases an interest in the growth and profits of the future, either by a share of the profits or

a reduction of the charges, the latter being preferable as it inures to the benefit of those who use the utilities, while a share of the profits benefits the taxpayers.

Our investigations teach us that no municipal operation is likely to be highly successful that does not provide for:

First—An executive manager with full responsibility, holding his position during good behavior.

Second—Exclusion of political influence and personal favoritism from the management of the undertaking.

Third—Separation of the finances of the undertaking from those of the rest of the city.

Fourth—Exemption from the debt limit of the necessary bond issues for revenue-producing utilities, which shall be a first charge upon the property and revenues of such undertaking.

We wish to bring to your consideration the danger here in the United States of turning over these public utilities to the present government of some of our cities. Some, we know, are well governed and the situation on the whole seems to be improving, but they are not up to the government of British cities. We found in England and Scotland a high type of municipal government, which is the result of many years of struggle and improvement. Business men seem to take a pride in serving as city councillors or aldermen, and the government of such cities as Glasgow, Manchester, Birmingham and others includes many of the best citizens of the city. These conditions are distinctly favorable to municipal operation.

In the United States, as is well known, there are many cities not in such a favorable condition. It is charged that the political activity of public service corporations has, in many instances, been responsible for the unwillingness or inability of American cities to secure a higher type of public service. This charge we believe to be true. However, there seems to be an idea with many people that the mere taking by the city of all its public utilities for municipal operation will at once result in ideal municipal government through the very necessity of putting honest and competent citizens in charge. While an increase in the number and importance of munic-

ipal functions may have a tendency to induce men of a higher type to become public officials, we do not believe that this of itself will accomplish municipal reform. We are unable to recommend municipal ownership as a political panacea.

In many cases in the United States the people have heedlessly given away their rights and reserved no sufficient power of control or regulation, and we believe that corruption of public servants has sprung, in large measure, from this condition of things. With the regulations that we have advised, with the publication of accounts and records and systematic control, the danger of the corruption of public officials is very much reduced.

To sum up, certain of the more important of our conclusions are:

First—Public utilities, whether in public or in private hands, are best conducted under a system of legalized and regulated monopoly.

Second—Public utilities in which the sanitary motive largely enters should be operated by the public.

Third—The success of municipal operation of public utilites depends upon the existence in the city of a high capacity for municipal government.

Fourth—Franchise grants to private corporations should be terminable after a fixed period and meanwhile subject to purchase at a fair value.

Fifth—Municipalities should have power to enter the field of municipal ownership upon popular vote under reasonable regulation.

Sixth—Private companies operating public utilities should be subject to public regulation and examination under a system of uniform records and accounts and of full publicity.

Seventh—The Committee takes no position on the question of the general expediency of either private or public ownership. The question must be solved by each municipality in the light of local conditions. What may be possible in one locality may not be in another. In some cities the companies may so serve the public as to create no dissatisfaction and nothing might be gained by experi-

menting with municipal ownership. Again, the government of one city may be good and capable of taking charge of these public utilities, while in another it may be the reverse. In either case the people must remember that it requires a large class of able men as city officials to look after these matters. They must also remember that municipal ownership will create a large class of employees who may have more or less political influence.

We trust that these suggestions may aid the people, whenever the time may come, in making a wise decision.

The above report is approved by the following nineteen members of the Committee of Twenty-one. Mr. Mahon was kept away from the sessions by sickness. Mr. Walton Clark wrote a separate minority report.

MELVILLE E. INGALLS, *Chairman,*
EDWARD W. BEMIS,
WILLIAM J. CLARK,
JOHN R. COMMONS,
CHARLES L. EDGAR,
WALTER L. FISHER,
FRANK J. GOODNOW,
JOHN H. GRAY,
TIMOTHY HEALY,
DANIEL J. KEEFE,
MILO R. MALTBIE,
H. B. F. MACFARLAND,
F. J. McNULTY,
EDWARD A. MOFFETT, *Secretary,*
FRANK PARSONS,
ALBERT SHAW,
J. W. SULLIVAN,
TALCOTT WILLIAMS,
ALBERT E. WINCHESTER.

MESSRS. CHARLES L. EDGAR AND W. J. CLARK DISSENT AS TO PARTICULARS.

We, the undersigned, dissent from the Report of the Investigating Committee, as follows:

1st. The Report says:

"We have come to the conclusion that municipal ownership of public utilities should not be extended to revenue-producing industries which do not involve the public health, the public safety, public transportation, or the permanent occupation of public streets or grounds, and that municipal operation should not be solely for profit."

This sentence is so drawn that to a casual reader it implies that the opposite is advisable. From this we strongly dissent.

2d. The Report says:

"To carry out these recommendations effectively and to protect the rights of the people, we recommend that the various states should give to their municipalities the authority, upon popular vote under reasonable regulations," etc.

The words "under reasonable regulations" were put into the report at the suggestion of Chas. L. Edgar, and were intended by him to mean such regulations as would compel deliberate consideration not only by the people but by their representatives, and would consequently prevent the superficial attractiveness of the scheme from overriding the sober second thought of the people. We strongly dissent from any definition of "regulations" which does not cover these points.

3d. The second and fifth conclusions in the latter part of the Report, being merely repetitions of previous statements, are, of course, subject to the same dissents.

CHARLES L. EDGAR,
W. J. CLARK.

MINORITY REPORT.

To the Commission on Public Ownership of the National Civic Federation:

GENTLEMEN—I have the honor to submit the following report of the minority of the Committee on Investigation, appointed by you under a resolution as follows:

Resolved, That Melville E. Ingalls, Talcott Williams, W. D. Mahon, Frank J. Godnow, Walton Clark, Dr. Albert Shaw, Edward W. Bemis, John H. Gray, Walter L. Fisher, Timothy Healy, William J. Clark, H. B. F. MacFarland, Daniel J. Keefe, Frank Parsons, John R. Commons, J. W. Sullivan, Leo S. Rowe, F. J. McNulty, Albert E. Winchester, Charles L. Edgar, Milo R. Maltbie, be appointed a Committee of Twenty-one to investigate in this country and in Europe the advisability of private and municipal ownership affecting gas, water, electric power and light, and street railways, and that this Committee of Twenty-one be empowered to fill vacancies or add to their number, subject to the approval of the Chair.

I regret that my understanding of your charge to the Committee of Twenty-one, to investigate and report to you, as per the above resolution, leads me to the necessity of presenting a minority report.

I agree with my associates on the importance of directing your attention to the dangers and difficulties attending municipal ownership. I do not dissent from their conclusion that companies entrusted with franchises and charters for the operation of so-called public service industries should be subject to regulation. I write a minority report because, if I correctly understand your instructions to your Investigating Committee, the majority report does not, in its form and scope, answer your reasonable expectation; and because I am not able to agree with what I understand to be the meaning of some few of the statements made therein.

Recognizing the almost supreme importance of an adequate and cheap supply of pure water, I dissent from one of the recom-

mendations of my associates, in effect that water works should be operated by public bodies. I dissent for the reason that my study of the report of the water works expert employed by your Committee, and my personal investigations, lead me to the conclusion that the water companies have made the more intelligent efforts toward adequacy and purity of supply, and that, all conditions considered, the result of their efforts has been and is a better and cheaper water supply and service than that maintained by the municipal water works departments.

I agree with the majority that such governmental conditions as exist in Glasgow, Manchester and Birmingham, are "distinctly favorable" to municipal ownership, as they must be to every urban activity, public or private. The fact that the results of the investigations we have made in these well-governed cities have not led my associates to commend municipal ownership as we have there observed it, or to recommend that our American cities adopt municipal ownership, is pregnant with meaning, and indicates another point upon which we are in accord.

My knowledge of the question, had from personal investigation, and from a study of the reports of the experts employed by this Commission, and of the writings of its members, leads me to the conclusion that the city and citizens of Glasgow, Manchester and Birmingham, as well as of the other municipalities investigated, are not so well served by their public service trading departments as the cities and citizens of London, Newcastle, Sheffield, Dublin and Norwich are by companies operating similar trading industries, and that there is no element of blessing in the municipalization in the former cities to compensate for the indifferent character of the service rendered.

I dissent from the statement of my associates that "we take no position on the question of general expediency of either public or private ownership." I come from the study of this question, and from the investigations in which I have had a share, including that of the municipal plants selected as being the most successful in Great Britain and in this country, ready, and with confidence, to take a position on the question of general expediency.

Because the investigation, in which, through your favor, I have had the honor to have a part, has convinced me that municipal ownership has not proven equal to private ownership in benefits to the consumer, citizen or city, I am not able to agree with the majority of the Committee that the way should be left open for any municipality to undertake any trading operation, without special authorization by the Legislature of the State wherein it is located. I cannot believe that the prescribed remedy for any ill should be a worse ill, and I cannot recommend that a municipality suffering, or believing that it suffers, under company administration of a public utility, should be given the right to engage in the operation of such utility for itself, without such a course of procedure as will make sure that the sober second thought of the people shall have ample opportunity for development and expression, before the community is committed to municipal ownership, with the accompanying dangers and difficulties, of which you are warned in the majority report.

Because I believe that the general credit of municipalities should be conserved for the benefit of public and necessary improvements, from which, in the nature of things, private enterprise is excluded; and because I believe that a municipality should not be permitted in any event to engage in any trading enterprise that will not pay its own way, and have the confidence of the citizens as financially sound, I recommend that municipalities be prohibited, by statute, from making investments in trading operations, except with money borrowed on mortgage, or otherwise, the loan being secured by a lien on the plant in which it is invested, and on the right to operate the same, and on these only.

Because I believe that it is practically impossible to secure private funds for investment in an enterprise subject to purchase by a municipality, at a date to be selected by the municipality; and because I believe that the impossibility of so securing private investment may, and often will, work a social harm to a community, I dissent from the opinion of the majority that a city should have the right to purchase, at its option, the property of public service corporations for operation, lease or sale.

I believe in State regulation and protection of public service companies. I do not understand that your Committee was charged with the duty of recommending to you a form of regulation. I know that your Committee made no special study of this subject. Therefore I am not prepared to propose any detailed plan of regulation.

Finally, regretting to be in any degree in conflict of opinion with my associates, I may still satisfy my sense of duty to my fellow-citizens and my sense of obligation to you for the honor of a share in this important work, by recording the conviction I am under at the close of this investigation.

I am convinced that the condition of the British people, individually or collectively, has not been improved by the municipalization of the industries we have investigated.

I believe that political and social conditions in the United States are less favorable to the success of municipal ownership than are the same conditions in Great Britain.

I find this conclusion strengthened by our investigation into municipalized industries in the United States.

I am convinced that, under American conditions, the system of private ownership of public utilities is best for the citizens and the consumers.

I recommend State regulation and protection of public service companies, provided by statute, and as far as possible automatic in its application and operation.

I realize that in the main the majority and the minority of your Committee are in accord. Wherein we differ, the minority appeals with confidence to a careful reading of the records of your Committee for judgment as to the reasonableness of its conclusions and recommendations.

Respectfully submitted,

WALTON CLARK.

THE AMERICAN MUNICIPALITY

By WALTER L. FISHER

In considering American cities it is at once evident that there is no single or uniform type of municipality. Each of the forty-five states has its own separate system of municipal organization, and in many states there are almost as many different systems as there are cities. There is neither a general law nor a common practice determining the form of American city government, but each individual city or group of cities is organized according to a local plan. For example, there is no uniformity in the relations between the city and the state in the United States. Some cities, of which Boston is a type, are in a condition of almost complete dependence on the state both in respect to the scope of the powers granted and in regard to the form of organization. On the other hand, in a group of states including Missouri, California, Washington, Oregon, Colorado and Minnesota, the state constitution authorizes either all cities or cities of a certain size to form their own city charters under a few broad general restrictions. In these cases the municipality enjoys an approach to local autonomy. Between these two groups of "state rule" and "home rule" cities lies the great mass of municipalities which have varying degrees of local independence in which they are protected by various devices, but which are in the main subordinate to the state from which they obtain grants of enumerated and specified powers and a form of government also closely defined.

Furthermore, there is no uniformity in respect to the organization of the city government. In some cities, of which New York is a type, the government to a considerable extent is centralized in the hands of the mayor, while the legislative body of the city—the city council—possesses comparatively little power. In other cities authority is divided more or less equally between mayor and council. Again, there has quite recently developed a form of municipal government known as the "commission plan," in which the powers of city government are vested in a small elective board which possesses both legislative and executive functions, as is seen in Houston and Galveston, Texas. Again, there is no uniformity in respect to the organization of the council. In some cities this body is unicameral, as in Chicago, New York and San Francisco; in others bicameral, as in Boston, Philadelphia and St. Louis. In some cities members of the council are elected by districts or wards; in other cases at large, and in still other cases partly by districts and partly at large.

A characteristic feature of American city government is the number and variety of elective administrative officers. In addition to the members of the city council, there is generally a long list of administrative officers chosen by the people at frequent intervals. This list seldom includes less than five or six officers, and sometimes is much larger. This multiplicity of elective officers makes unity and responsibility difficult to obtain in city government, and at the same time in connection with the choice of state, county and national officers, tends to confuse and perplex the electorate and to make intelligent and discriminating choice difficult. It is to be observed, however, that there is a strong general tendency to reduce the number of elective administrative officers. Thus in New York there are but two administrative officers elected at large, the mayor and the comptroller, and in Chicago three, viz.: mayor, city treasurer and city clerk. At the same time the tendency is to grant the mayor complete power of administrative direction and control over all other city officers. In this way the problems arising from the decentralization of city government are likely to be solved in the near future in the more progressive cities

The fact is that most of the cities in the United States have simply copied the scheme of the federal government without inquiring at all whether this plan had any real adaptability to municipal affairs. Many of them are simply the national government *in parvo*—an elective executive modeled on the President, with two houses of a local legislature modeled on Congress, one house having a large membership like the House of Representatives, and one having a smaller membership, in the attempt to ape the United States Senate. Of recent years, however, the practice of having two chambers has been quite generally discarded. Where there are two branches of the city council we have not followed the English municipal practice of having the aldermen elected by the councilors, but have made the only difference between the two houses the election of a smaller number to the upper house and electing them for larger constituencies or longer terms, or both.

In the United States it is the firmly established practice, even where not required by law, to choose legislative representatives, whether in Congress or the city council, who reside in the territorial division which they represent. While this limits choice it is undoubtedly true that few constituencies fail to be creditably represented merely or chiefly because they do not contain residents who would be valuable members of a legislative body in a truly representative democracy. The vigorous, independent and intelligent American working-man or mechanic is a distinctly desirable member of an American city council. That he is not more frequently elected is seldom due to his absence from even the wards which are least attractive as residential districts. The non-resident property owner is never allowed to vote. Materialistic as the American is often alleged to be, he does not bestow the ballot upon property.

The great distinction, however, between the American and the British municipality is the election of the executive officers by the people. This is the great difference between American and British national government. It accounts in large part for the inefficiency and artificiality of the American municipality. One great cause of the inefficiency of American municipal government has been a failure to comprehend or to apply the true principle of representative democracy. Representative democracy can never be successful unless its institutions are simple and its methods direct. It is only recently that the American people are beginning to understand that a democracy cannot successfully operate a complicated political machine. A growing intelligence has, however, already resulted in a distinct tendency to lessen the number of elective officers and to increase the direct control of the people over their nomination and election.

The early popular idea, based on a fear of heredity and absolute monarchy, was that all government is an evil and a menace to the community, and furthermore that the greater the number and complexity of the checks and balances and other restrictions placed around the exercise of political power the more secure would be the liberties of the people. It is now coming to be understood that both of these ideas are fallacious from the philosophical point of view and disastrous in practical consequences. It is now recognized generally that government is not always a necessary evil, but that within its proper functions it may be and is under certain circumstances a positive good, and that complexity and intricacy of governmental machinery is on the whole more likely to hinder and obstruct the public spirited than the selfish elements in a political society.

The foundation upon which American government, national, state and municipal, rests is that of universal suffrage. To this there are some additions and there are some exceptions from it, but adult manhood suffrage is the general rule. In four of the western states, Colorado, Utah, Idaho and Wyoming, and in the municipalities of Kansas women are admitted to the electorate on equal terms with men, and in about one-half of the states women are granted the right to vote on educational matters. There are also certain restrictions in the form of property or educational requirements, found principally in the south, but also to some extent in New England and the west. A bitter contest was fought in the early part of the nineteenth century over the admission of the non-property holding classes into the electorate, but this battle ended in a complete victory for universal suffrage, and it appears fixed as a foundation principle in the United States. Whatever changes are attempted in the structure and powers of American municipalities must be made upon this broad, democratic foundation.

The activity of elaborately organized political parties in the American government is a feature which characterizes our municipal system. Great evils have arisen out of their domination of

American cities. The difficulty has been intensified by the presence of the spoils system in which office is treated as the legitimate asset of the party in power, and by the fact that the parties in control have been national parties, divided on national issues rather than upon local lines. These considerations have made it difficult to obtain a direct vote upon questions of local importance, and to secure efficient service from the successful party even if victorious upon the local issue. The blighting effects of partisan rule upon the government of cities have been so often described that no enumeration of particulars is necessary. It should not be forgotten, however, that within recent years there has been a strong tendency away from the evils that the party system has inflicted upon the city. Even the sincere and ardent advocates of the national political parties have recognized that these evils are reacting injuriously upon the national parties themselves. A series of measures has been adopted tending to eliminate some of the more serious abuses. Provision has been made in many cases for the holding of municipal elections upon a different day from that of state and national elections. Laws have been passed in most large cities and in some small cities providing for the substitution of the merit system instead of the spoils system, and the enforcement of these regulations is increasingly intelligent and effective. There is also a widespread movement toward primary or nomination reform and a sentiment of some strength in favor of nominating municipal officers by petition only, in place of the system of party nominations. In some instances this plan has been carried out in the choice of school officers. Changes in the ballot law tending to place the intelligent and discriminating voter at least upon an equal footing with the blind partisan of a straight party ticket are appearing in many cities. It must be conceded also that, in the American party system, the control of political parties over cities is much weaker than their control of the county, state and national government, and that the tendency toward disregard of national party ties in municipal affairs is rapidly growing. Furthermore, it must be conceded that even where national parties do dominate local affairs they have often been able to do this only by making important concessions to local sentiment, either in the form of more efficient administration or of responsiveness to public demand for some particular legislative policy.

The efficiency of American city government is in general directly measurable by the degree of public interest developed. Where sentiment in the community has demonstrated a fixed purpose, even the most corrupt political administration has generally followed it. In the administration of public schools, perhaps the most difficult and delicate of all public functions, American cities have as a rule been conspicuously successful. In this case, the public interest has been so strong and has been so effectively manifested as to make slovenly administration dangerous to the party in power; and practical politicians have been quick to recognize this and to act upon it. Again,

where there has been effective sentiment in favor of parks and other recreation facilities, they have been obtained without great difficulty, and these park systems have generally been maintained with a considerable degree of efficiency. Again, the fire departments of American cities are conspicuous examples of successful administration. No cities in the world are so well equipped with apparatus for protection from fire, and no cities have such well organized and effective forces for using this apparatus as have the American. In all of the cases cited public sentiment imperatively demands the highest grade of service and will be satisfied with no other. In fact, it is safe to say that wherever the people of the city have displayed consistent interest in any public enterprise, the government has shown a considerable degree of skill in administering such affairs.

On the whole, however, it must be admitted that the grade of service rendered by American cities has not been high. Ignorance, incompetence and extravagance have too often characterized many of the departments of city government. The significant fact is that it is not the complexity or difficulty of the tasks which has caused a breakdown of the administration, but the general apathy and indifference on the part of the electorate. This accounts for the curious fact that the delicate work of educational administration has, on the whole, been successfully performed, while the comparatively simple work of street paving and cleaning has been very badly done. These results are due, in great part, to the preoccupation of those citizens whose energy, elsewhere applied, has produced marvelous results. The typical American municipality owes its existence to the fact that the laws of modern industrial development—manufacture or commerce—have made some particular spot in the wilderness or on the prairie available for the establishment of commercial enterprises. At this point men have come together, impelled primarily with the commercial motive. The first necessity of the American municipality has been to convert this particular spot into a place where modern business can successfully be carried on. This task it has certainly accomplished. Great as has been the growth of American agriculture, the growth of manufacture and of commerce has been more remarkable. The marvelous industrial development of the resources of a continent, which has so largely absorbed the energies of the American, has been essentially urban in character. In the very nature of the case, its inhabitants have thought of the city chiefly in its relations to their private enterprise, and not in the broader aspects of an organized community. As a matter of fact, they have thought very little or not at all about the true needs and functions of municipal government. In the old contest between individualism and collectivism, the American has been pre-eminently an individualist. He has preferred to look to private enterprise rather than to communal co-operation. He has demanded of the city that it shall interfere as little as possible with private initiative. Even when co-operation has been necessary, he has preferred voluntary co-operation rather than governmental co-operation. Until very recently few indeed have realized the connection between the citizens and

the city; that the city cannot meet the legitimate demands of the private interests of its individual citizens unless it is able efficiently to meet the legitimate demands of the organized community.

A second important cause is the fact that the forms of municipal government have been little adapted to municipal needs, but have been largely the product of careless imitation of state and federal governments, or developed on the theory that government is most democratic when most complicated and involved. Both of these facts have worked havoc in the government of cities, and made the task of constructive democracy more difficult than in British municipalities. It has already been shown that these ideas are being rapidly repudiated and the progressive cities are reconstructing their governments on a basis of simplicity of form and directness of responsibility. The development of governments capable of action, and directly responsible to the people for their action, cannot fail to result in a decided improvement of every American city in which popular opinion is reasonably alert.

It is in the regulation of public utility corporations that American municipalities have, as a rule, been most conspicuously unsuccessful. Adequate provisions securing to the public proper service, proper rates of service, reasonable extensions and improvements and the necessary publicity in regard to the financial aspects of the business, have seldom been made. The attempt to control and regulate street railways, gas, electric light and telephone companies has, on the whole been unsuccessful because of the powerful special interests which have either controlled or strongly influenced the governing partisan power in the community. The chief sources of corruption in American cities are necessarily public contracts and the granting of special privileges or exemptions. As a matter of fact, the latter has been the most important contributory cause. There have been many and great abuses in connection with public contracts, but the most serious scandals have almost always been connected with or centered around special privileges, and chiefly public utilities. Those who seek special privileges have been most likely to offer illegal inducements to the public official who has power to grant these privileges. They have been the most obvious and alluring victims of the predatory "grafter." They create and maintain a continuing lobby—always defensive and frequently offensive—because they have a constant incentive through their necessary relations with the public authorities. A contract, or the securing of a contract, on unfair terms invites occasional corruption; a franchise usually involves the continuous maintenance of a "sphere of influence" in the city government.

Not only is this true, but the corruption of city government for the purpose of obtaining valuable special privileges at little cost has had the effect of demoralizing municipal government for other purposes. Public officials who can be relied upon by special interests to give away franchises or other privileges cannot be relied upon by the people to provide an effective and honest police force or high grade street paving or adequate street cleaning or

any other elementary function of city government. On the other hand, aldermen and city officials who can be relied upon to furnish strong and energetic administration of public affairs, cannot be relied upon by the corporations or individuals concerned to grant special privileges upon terms unduly favorable to them. Since it is practically impossible to isolate the different departments of city government, the contamination of one has tended to affect all. In any study, therefore, of the relations between the American city and public utility corporations, it must be borne in mind that one reason for the weakness of American city governments has often been the very action of these special privilege interests themselves.

It has become evident in the United States that whatever may be the efficiency or inefficiency of American municipal government the city cannot escape from the necessity of controlling in some effective manner the management of its public utilities. The municipality cannot abdicate its normal and necessary function of control over business "affected with a public interest." No city is too weak or inefficient to undertake this function of government; or if it is, then it imperatively requires immediate reorganization and regeneration. The city must either regulate and control the management of these interests in the hands of private individuals or corporations, or it must take them over and own and operate them itself. Efficient public regulation of public utilities in private hands requires, however, a high degree of ability and integrity on the part of public officials who are charged with this duty. It involves perfected machinery for financial publicity, for supervision of service rendered, and for regulation of rates, with the high intelligence and perfect integrity indispensable for this difficult work. Regulation does not end with the formulation and adoption of a satisfactory contract, in itself a considerable task. If this were all, a few wise and honest men might, once in a generation supervise the framing of a franchise in proper form, and nothing further would be necessary. It is a current fallacy and the common practice in American public life to assume that a constitution or a statute or a charter, once properly drawn up by intelligent citizens and adopted by an awakened public, is self-executing and that the duty of good citizens ends with the successful enactment of some such well matured plan. But repeated experience has demonstrated—what should have been always apparent—the absolute futility of such a course, and the disastrous consequences of reliance upon a written document for the purpose of living administration. As with a constitution, a statute or a charter, so with a franchise. It has been found that such an agreement is not self-enforcing, but must be fought for through a term of years as vigorously as at the time of formulation and adoption. A hostile, lax or ignorant city council, or even a state legislature, may vary the terms of the agreement in such a manner as totally to destroy or seriously to impair its value. The administration may ignore or fail to enforce compliance with those essential parts of a contract entrusted to its execu-

tive authority; and legal proceedings, requiring the highest order of ability and involving a long series of judicial controversies, are frequently unavoidable long before the time of the franchise has expired. In the meantime the special privilege interest has remained entrenched in authority, watchful of every opportunity to win a point, and wielding the whole force of its influence against vigorous enforcement of the terms of the contract. It has still maintained a powerful lobby; its representatives have continued to sit in the councils of the party chiefs; its treasury has still figured heavily in campaign funds; it has still struggled for control of the city council, and for possession of administration, and still employed its skilled legal talent in the courts. For lax administration of the law means greater gain, and strict enforcement lessened profits. Only a vigorous and efficient municipal government can hope to compete successfully with the unceasing and resourceful opposition of the public utility corporation to thorough-going publicity, to adequate regulation of service, rates and extensions. The battle that wins a favorable franchise for the city is in reality only an incident in the long war, open or covert, for adequate regulation. Neither the practical politician nor the skillful promoter is deceived in this, although the honest, and sometimes the intelligent, citizen goes astray at this critical point.

Much of the incentive for this continual conflict of interest has been due to the exploitation of public utilities by speculators and promoters. The stocks and bonds of these corporations must be made to represent only legitimate and genuine investment and the profits must be limited to sure but reasonable returns before this incentive can be removed. In some instances, notably in Massachusetts, a certain amount of public control over the capitalization of public utility corporations has been secured, and it is being provided for in many recent statutes and ordinances in response to a rapidly increasing public demand. It is, of course, usually claimed, and it is sometimes true, that the political activity of the public service corporation, after it has been granted and has agreed to a franchise fairly protective of the public interests, is due to the necessity for self protection against unreasonable attacks by public officials inspired by corrupt or demagogic motives. To remove such a justification where it exists and to render public regulation intelligent and fair as well as effective, is one of the results hoped for from the creation of supervising boards of engineers and expert commissions under legislation such as the recent street railway ordinances in Chicago and the public utility statute in New York.

On the other hand, it has been demonstrated by the experience of such American cities as have undertaken the ownership and operation of particular utilities that here, too, success depends upon honest and efficient government and this, in turn, upon intelligent and determined public sentiment. To the extent that the continuing private interest of those who have owned and operated these utilities for private gain has been removed from active participation in politics and government, municipal politics has naturally become

more honest and municipal government more efficient. Where, however, other influences have continued to produce political and governmental dishonesty and inefficiency, public ownership has necessarily produced unsatisfactory results. That such other influences do exist and that public ownership of any particular utility in any particular city at any particular time, must necessarily reckon with many serious difficulties, is susceptible of dangerous political abuse and involves serious financial risk, has been sufficiently apparent.

Many American cities are without legal power or immediate financial ability to acquire and operate all or some of their utilities. Many of them are without a sufficiently intelligent and effective public sentiment to give reasonable assurance of honest and efficient administration even when the active influence of the private interest has been removed. That the city should have legal power to own and operate its utilities is, however, being generally conceded and enabling legislation has recently been enacted in many states. This has been due not wholly to a demand for actual public ownership, but in large part to the recognition of the fact that public regulation can never be really effective unless there exists the present power of the city to take over the particular utility upon proper terms if its private owners fail to operate and develop it in compliance with reasonable public requirements and as an effective agency for the public service.

That public sentiment has become aroused and is determined to secure honest and efficient municipal administration is being demonstrated in many American cities and in many ways. Not only are public spirited citizens everywhere encouraged by what has been accomplished generally with the parks, with fire protection and with public education, but in many cities, corrupt political bosses and machines once thought invincible, have been overthrown. Honest and competent officials have been elected, the machinery of nomination and election has been simplified, the form of municipal government has been more closely adapted to municipal needs and its administration has become more responsive to disinterested public sentiment. The spoils system has yielded to an increasingly effective enforcement of civil service laws which are being rapidly extended over American cities. Crude or half-hearted efforts characteristic of the introduction of the system have given way to more scientific methods and a fixed determination to perfect and to apply the merit tests. In many instances this has practically made of the public utility corporation a city of refuge for the political spoilsman whose followers have been driven from the civil service. Directly or indirectly the private owners who supply the public with gas, electric light, telephones and street railways, often furnish employment for considerable numbers of men whose chief qualification is the endorsement of an influential politician.

Where the municipality has directly taken over a public utility it has, of course, added a considerable number of employees to the city pay roll, with a consequent increase of possible political

spoils. However, wherever civil service laws have been in force, the partisan activity of these employees has been more effectively controlled than would be possible if they owed their position on the pay roll of a public service corporation to the active influence of a political leader. It was a Chicago alderman who was at one time reported to have some two thousand men so employed. A prominent official of a large street railway company, thoroughly familiar with its management, once informed the writer that considerably more than 50 per cent. of its operating employees had secured their positions through the recommendation of members of the city council, and he attributed the inefficiency of the street railway service in part to this fact. Official investigations have also disclosed that the campaign funds of the dominant political party, and not infrequently of both parties, have been derived to a considerable extent from public utility interests, which in this way obtain a controlling influence over platforms and candidates. Keen observers of political facts are well aware that in many cases, especially so far as city elections are concerned, "there is no politics in politics," but that a comfortable community of special interests controls both parties and restricts the field of political controversy as far as possible to candidates and to issues that are "safe and sane."

To these influences has in large part been due the perversion of the popular demand for a "businesslike administration" of American cities. That many of the methods of efficient private business should be applied to municipal administration is of course self-evident; but that municipal government, even in its business aspects, is essentially unlike commercial competition is equally apparent. If municipal government is "business" it is not competitive business and its sole object is not a money profit. The inability to grasp this fundamental fact accounts for many of the failures of so-called "business men" as municipal officials. Municipal government seeks to supply certain essential requirements, or desires of the individual citizen not only at the lowest cost consistent with the best service, but in such a manner that the result shall be most advantageous to the community as a whole. Personal experience and even great financial success in competitive commercial life sometimes appears to obscure the true application of this basic principle in municipal affairs.

It is not the province of this article to indicate how far or under what conditions the evils which now confront the American city can be removed by the policy of municipal ownership of public utilities, or to discuss the measures now being adopted for their more effective regulation, but merely to point out the general conditions which now exist. The general adoption of the policy of public ownership will undoubtedly bring new difficulties and new dangers. It will undoubtedly remove or lessen some of those which now exist. What must be recognized is that the city cannot escape its primary obligation so to develop and control its public utilities, whether in public or in private hands, that they shall be effective instruments for the service of the individual citizen and for the development of the organized community.

THE BRITISH MUNICIPALITY.

By FRANK J. GOODNOW

The American who gives some study to the British municipality has his attention constantly drawn to the contrasts rather than to the resemblances between the British municipal system and that which exists in the United States. He sees that all the leading executive functions are discharged by council committees, and not by a Mayor and heads of executive departments. He sees that in general the work of the municipality is regarded simply as a form of business, to be carried on irrespective of national politics. He sees that British traditions prescribe permanence of official tenure and technical rather than political ability for the most important municipal officers. He sees that the relationship between the aldermen and councillors and the electoral districts they nominally speak for is foreign to the American idea of representative and constituency. He sees a restrictive suffrage. He sees, in a word, an administrative organization, a local legislative and executive machinery and a political system unlike those with which he is familiar. But above all else he finds food for contemplation in the significant differences between the United States and Great Britain that arise to view as he gradually comes to understand the social basis on which British municipal institutions are erected—differences which clearly reveal to him that he is face to face with social conditions which do not find their parallel in his home in the new world.

Hence a comparison of the conditions in Great Britain and the United States that bear upon municipal ownership and operation of public utilities may not be confined to the consideration of the law governing the organization and powers of British municipal corporations, but must be directed as well to the general social basis on which the political structure has been reared. Any attempt to imitate in American legislation the British law with regard to the powers of municipal corporations will be foredoomed to failure if account is not taken of the social conditions which have made that law what it is.

Wherein, then, do the social conditions of Great Britain differ most widely from those of the United States? The answer is, in a word, that Great Britain is aristocratic, while the United States is democratic. Great Britain is aristocratic not merely in that property is probably much more unequally distributed than in the United States, but in the existence of a class feeling whose

influences are to Americans difficult of comprehension. One effect of this class feeling which has an important bearing on the question under consideration is a deference on the part of the large mass of the population to what are recognized as the upper classes. This deference makes the voters willing, if not eager, to obtain members of that class to represent them in the city government.

A typical instance of the results which are brought about by this action on the part of the great mass of the people is to be found in the City of Liverpool[1]. Liverpool is divided into 35 wards. Thirty-four of these wards are represented by one alderman and three councillors for each ward. One ward is represented by only one councillor. The council consists therefore of 137 members. Of these 137, only 25 live in the wards they represent, while 112 live outside the wards which have elected them as their representatives in the council or to which as aldermen they may have been assigned. Of these 112, 50 live outside the limits of the corporation. These 50 suburbanites, if we may so call them, are all of the upper business and professional classes. Furthermore, 44 other members of the council live in the six richest residential wards of the city. With the 50 suburbanites there are thus in all 94 members of the council who live in the better residential districts within or without the corporation.

The degree to which the poorer classes of the community are represented by members of the wealthier classes becomes more apparent if we compare the working class wards with the richer residential wards. Twenty of the wards may be described as working class wards, including at one extreme the slums and at the other the districts in which reside the upper grades of artisans. Of the 80 aldermen and councillors accredited to these wards only eight live in the wards they represent, and of the 72 who live outside the wards they represent 53 live in the six richest residential wards of the suburbs. On the other hand, of the 28 representatives of the seven residential wards occupied by the middle and richest classes 16 live in the wards they represent and only 12 outside. These outsiders live in other wards or in the suburbs among people of the same social standing as those they represent. Thus, while the strictly working class wards are entitled to 80 representatives two-thirds of these representatives reside in the residential wards and suburbs; while the people of the residential wards which are entitled only to 28 representatives elect practically all of such representatives from among their own neighbors. Finally, there are two strictly business and commercial wards represented by business men.

The Council of Liverpool is thus in control of the richer classes of the community. A few members of the council are described as "very rich men." At least 100 of the 137 members are said to be "fairly well-to-do," or "moderately wealthy." Only about 20 are described as "poor men." Of these 20, only 4 are elected

[1] I am indebted for the statistical data in this paper to Prof. John R. Commons.

as labor men, or as officials of trades unions. Another census of the council brings out the fact that it contains 39 wholesale and retail merchants, 12 brokers and agents, 9 manufacturers, 12 lawyers, 11 building employers, 5 trades unionists and Socialists and 15 engaged in the liquor business. It is significant, however, that nearly all of these 15 are manufacturing brewers and not retail liquor dealers.

In a word, it may be said that the members of the Council of Liverpool are to the extent of two-thirds large and small business men and employers of labor and to the extent of one-fifth professional men whose associations are with business men.

What is true of Liverpool is also true of other British cities. Birmingham has 72 aldermen and councillors for 18 wards. Of the 60 members of the council with regard to whom information has been obtained only 10 live in the wards they represent and 50 outside such wards. The 13 working class wards are represented by 7 members living inside and 45 outside the wards. The 72 members include 17 merchants, 21 manufacturers, 6 lawyers, 5 physicians, 5 brokers and 7 "gentlemen"—that is, men living from the income of their property.

Manchester has 120 aldermen and councillors representing 30 wards. Eleven of the wards as to which information has been obtained have 25 representatives living in the wards and 19 living out of the wards they represent.

Leicester has 16 wards and a council of 48 councillors and 16 aldermen. Of the 48 councillors, 32 live outside the wards which they represent. Of the 16 aldermen, 6 live outside such wards. In all, 38 members of the council do not live in their wards and 26 do. The 9 working class wards are represented by 16 non-residents and 11 residents.

In Glasgow, the council consists of 78 members representing 26 wards. Of these 78 representatives, 27 live in the wards they represent and 51 live outside such wards. The 14 working class wards are represented by 12 members living in the wards and 30 members living outside. The six residential wards are represented by 13 members living in the wards and only five outside. About five members of the Glasgow Council are considered to be men of wealth, while 50 are moderately wealthy or fairly well-to-do.

The London County Council is made up of 118 councillors elected from 58 districts and 19 aldermen elected by the council. Of the 118 councillors, 50 live in the districts they represent and 68 live outside. Among the members of the council are to be found 21 merchants, 15 manufacturers, 18 lawyers, 4 builders and 11 labor representatives, of whom 7 are trades union officials and 4 reputed to be Socialists. The London County Council is exceptional in having 10 retired civil servants and 20 "gentlemen," and is also peculiar in possessing a large number of representatives, namely 34, who have inherited their property in whole or in part. As a general thing the men of means upon the various city councils in Great Britain have acquired their property by their own exertions.

The fact that such a large proportion of the municipal councillors are not residents of the wards they represent attracts scarcely any attention among the voters. Occasionally it is stated that a resident would be preferred if there were such a one well qualified according to British ideas; and a few labor councillors declare that owing to the predominance of representatives living in residential wards those wards are disproportionately cared for in the way of parks and improvements. Perhaps one reason why the voters—especially those of the working class wards—do not insist upon their representative residing in their ward is the lack of patronage at his disposal.

In choosing persons recognized not of their own class as their representatives in the city government, the voters in Great Britain are probably not in all cases consciously actuated by a desire to honor those whom they deem to be their betters. On the contrary, in many if not most cases they are in all probability governed by the belief that in thus acting they are securing a more efficient representative than one residing in their district would be. For, to be influential in English political life a man must be socially presentable and if possible well connected.

Sidney Low, in "The Governance of England," has pointed out how small is the class which is politically influential in Great Britain and how impossible it is for a man to become politically important who is not by birth or education capable of so comporting himself as to be welcome to that class. If one is not thus welcome, it is difficult if not impossible for him to obtain access to those in control of the government.

While what Mr. Low says is unquestionably more pertinent to imperial than to municipal politics, it is none the less true that his remarks have an application, even if limited, to municipal government. For, as a result of that desire which would seem to be common to all men to imitate what they admire, those in control of the city governments, although not of the recognized aristocratic classes, do not fail to be influenced by aristocratic ideas. They thus strive to carry on their municipal business by methods and according to standards which conduce to great official dignity and decorum. One of the results of this course on their part is that it is difficult, if not impossible, for a poor man who may be elected to a city council to keep the pace believed to be necessary by his fellow representatives. This difficulty is naturally increased by the fact that while conscientious service by a municipal councillor absorbs a great deal of time it is absolutely unremunerated. Notwithstanding this gratuitous character of service as city councillor, it is possible to secure good men in the councils because of the belief that successful service for the municipality will be rewarded by a personal and social distinction which can with difficulty be secured in any other way.

The outcome is that most members of the city councils are men of considerable means and that few if any of those who are classed as labor aldermen or councillors are really representatives

of the laboring classes in any sense, except that they are in sympathy with certain aspirations of those classes and in cases endeavor to better their lot.

A second general effect of the class feeling to which allusion has been made is to be seen in the conditions of suffrage. The English idea of suffrage in municipal affairs is that property, rather than man, should be represented. This is seen first in the fact that mere residence in an election district will not qualify; and, second, in the fact that mere residence outside the district will not disqualify. The only thing that will qualify is the payment within the district of rates, or local taxes as we should call them, and such taxes are payable by one who in the eyes of the law occupies property therein, and not by the actual resident in the district, who legally may not be an occupier of taxable property therein.

In a general way the qualifications of municipal suffrage are as follows: Every male and every unmarried female, a British subject of full age, who on the 15th day of July in any year is and has been during the whole of the last preceding twelve months in occupation, joint or several, of any house or other building in the borough, has during the whole of the said twelve months resided in the borough or within seven miles thereof, has been rated in respect of the qualifying property to all poor rates made during those twelve months and has before July 20 paid all rates levied up to the then last preceding 5th of January, shall be entitled to a vote at every municipal election, provided he or she has not within the twelve months preceding received charitable relief. Recent legislation and the decisions of the courts have brought it about that the term "occupation, joint or several" means the occupation of a separate part of a house, such as one room (but does not mean the occupation of the room as a servant), and that, if some one else has been rated for the qualifying property and has paid such rates a person otherwise qualified and occupying such property is entitled to vote. It has hence become the almost universal practice of landlords throughout England to pay the rates of their smaller tenants and to reimburse themselves by an increase in the rent.

The results of these suffrage qualifications are, in the first place, that from 25 to 40 per cent. of the adult male population of the cities are not legally entitled to vote; and, in the second place, that owing to the long period of residence required, namely, twelve months (which in some cities, because the period must be twelve months prior to July 15, and the list is not made up until the following October 1, is increased to fifteen months) there is no floating vote. Other circumstances lead to the result that many who at one time are legally qualified are at another disqualified or disinclined to vote or by some means fail to get on the registry list and are therefore unable to vote.

The most potent of these circumstances is poverty as evidenced by the acceptance of charitable relief. Another is that where landlords pay the rates their returns to the registration

office of the names of their tenants are notoriously inaccurate. It is charged that many landlords do not return the names of those tenants who do not agree with them in politics.

The negligence of landlords is to some degree offset by the efforts of party managers who greatly aid the registration officers in making up the registration lists. Furthermore, while the small occupiers and especially lodgers must make application each year to be put on the lists, the larger occupiers who pay their own rates are carried on the lists indefinitely until stricken off. The presumption is in favor of the occupier or householder, but against the lodger. It is asserted that while there are 80,000 lodgers on the register in London, fully twice that number are omitted as a result of their neglect to claim their rights, while there are believed to be 100,000 male adults who are not legally entitled to register.

Another circumstance which reduces the number of voters, and which has peculiar influence in Glasgow, is the failure of the smaller rate payers to pay the rates promptly, if they pay them at all. Because of this negligence they are unable to vote.

It would seem to be the general opinion that the following classes of the population are disfranchised:

First—The submerged tenth, that is, the confirmed pauper, semi-criminal and casual labor classes.

Second—The reputable working men of the poorer paid working classes in time of industrial depression.

Third—All lodgers in holdings which rent for less than £13 a year. This figure seems to be agreed on in practically all the different cities as the minimum rental below which a voter shall not be entitled to the lodger's franchise. As a result, the sons of all common or unskilled laborers are disfranchised.

Fourth—The sons of the better paid workmen who could qualify as lodgers, but dread the publicity, the challenges of party agents and the exposure of their private affairs.

Fifth—A number of the smaller householders, who being once stricken from the lists when challenged prefer not to contest their rights rather than to undergo the publicity and exposure of their private affairs that would result from an insistence to qualify as voters.

Sixth—Persons not wage-earners, especially clerks living at home or as lodgers, and even wealthy young men, who are excluded because they neglect to make application for the lodger's franchise.

While the disfranchisement which has been described tends to diminish the political power of the poorer classes, the influence of the well-to-do classes is increased as compared with their influence in the United States. For although not resident in a city a person may vote for municipal officers therein in case he occupies for business or professional purposes property within the city. In some cities, such as Birmingham, Liverpool and Manchester, there are wards where such voters equal or even exceed in number the resident voters.

If we now compare the conditions in New York and London we find that the registration list embraces in the former about 16 per cent. of the population; in the latter about 12. The New York registration list would be on the London basis about 480,000, instead of 660,000. In other words, more than 25 per cent. of the present voters in New York would be disqualified if the conditions of suffrage therein were the same as those obtaining in London.

We may say then that the control of the city governments throughout Great Britain is in the hands of the well-to-do classes, mainly because of the traditional habits of mind of the British people, but also partially in consequence of the operation of the legal qualifications of suffrage. We may further remark that as a result of the suffrage qualifications the mass of the most unintelligent portion of those who may vote in this country, among them the bulk of the purchasable vote, is prevented from voting in Great Britain.

Not only are the social conditions and the conditions of suffrage in which they find their expression aristocratic, but the political organization of the British city is as well aristocratic, at least when compared with the municipal organization developed in the United States, which has been formed to meet the demands of a community priding itself on its democracy. The organization of the British city is also simple when compared with the rather complex organization of most American cities. All powers are centered in a council whose members, the mayor excepted, consist, outside of Scotland, of two classes—the councillors and the aldermen. The councillors are elected by the voters, who in the larger cities act in districts. Their term of office is three years, one-third being elected each year. As three represent each district, it follows that one councillor is elected each year in every district. Every male voter of the borough, except those specifically disqualified as being a city officer or a clergyman, is eligible as councillor. Furthermore, persons living within 15 miles of the borough who are otherwise qualified as voters and have property of from £500 to £1,000, dependent upon the size of the city, or who pay rates on the value of from £15 to £30, dependent also on the size of the city, are eligible as councillors. The councillors outside of Scotland elect aldermen in number equal to one-third of the councillors. Each alderman serves for a term of six years, one-half of the aldermen being elected every three years. Every person eligible as councillor is eligible to be an alderman. The council elects from among those persons qualified to be councillors, the mayor, who serves for one year. Every member of the council, including the mayor, is indefinitely re-eligible.[1]

[1] London is an exception to this statement, being governed by the provisions of the Local Government Act of 1888, and not by those of the Municipal Corporations Act of 1882. It has 57 districts, which elect two members each to the County Council, and one, viz.: the "City," which elects four. All are to be elected every three years. The Council elects 19 Aldermen, who serve six years. Furthermore, London is divided into 28 boroughs, each of which has its own organs of local government.

A characteristic feature of this organization is that apart from London it is comparatively permanent in its membership. Leaving the aldermen out of account, it requires three years to change completely the membership of a council; taking them into account, the term must be doubled. Re-elections of councillors are very frequent. It is not uncommon to find members of city councils who have served ten, fifteen, or even twenty years. Re-election of councillors is facilitated by the provisions of the election laws which make unnecessary a resort to the polls in a district which is not contested, *i. e.*, a district in which only one candidate is nominated. Uncontested elections are not infrequent in the case of members of the council who have represented their districts satisfactorily to the voters and are not unknown in the case of first elections. At present there is a member of the council in one of the large British cities who has been on the council more than twenty years and whose name has never been voted on by the members of the district he represents.

A word should perhaps be said on the subject of the methods of nomination in connection with this matter of uncontested elections, since in the judgment of many the methods of nomination have an influence upon such elections. The ballot act of 1872 which, with its amendments, regulates nominations for public office, provides that no vote cast for a candidate whose name is not on the official ballot shall be counted. The only way in which a candidate's name can be placed on the ballot is through nomination by two voters as proposer and seconder, assented to by 8 voters and made in the way prescribed by law. No recognition of the party which is supporting a candidate is made in the law, and the expense of printing the ballot is to be paid by the candidates thereon. It is of course true that parties do exist and support and even nominate candidates. At the same time the freedom of nomination permitted by the law makes the formal support of a party of less importance to a candidate than in the United States and to that extent makes it easier to divorce national from city politics. Finally, municipal elections are governed by the provisions of the Corrupt Practices Prevention Acts, which punish the bribery, treating and undue influence of voters by violence or fraud, limit the amount of money candidates may spend for election purposes, make void the election of one who is found guilty of such corrupt practices and disqualify such a person for municipal office for seven years.

All powers vested in the city are with slight exceptions vested in the council. Subject to these exceptions, the council determines what city offices there shall be and appoints the incumbents of such offices. There is no bulky ballot to be cast for city officers by the voters. The council also determines the policy which is to be adopted by the city and, subject to a control exercised over it by an administrative authority of the central government at London, raises taxes, spends money and may incur debt. Outside the field of the operation of public utilities, the council has wide powers

under the general provisions of the Municipal Corporations Act. Within that field, however, the council is subject to the control of the Board of Trade, a department of the central government, as to the expediency of taking over any public utility, and of the Local Government Board, another department of the central government, as to the amount and form of the debt to be incurred therefor and the methods to be adopted for its repayment.

The consent of the Board of Trade to the taking over by a city of a public utility is given by the issue of a provisional order subject to the approval of Parliament, which is usually granted as a matter of course; that of the Local Government Board to incurring debt, by its formal approval of a definite proposition to borrow money. In case, however, either of these bodies refuses its approval, the cities may, and, as a matter of fact, frequently do apply to Parliament for a special act. But the city council must have the approval of the rate payers and property owners of the a bill. As this promotion usually involves the expenditure of considerable sums, it follows that the consent of the ratepayers and property owners is a necessary prerequisite to a resort to this sort of special legislation.

Probably the most important exceptions to the rule that all powers of government are given to the city council are to be found in the care of the poor and the control of the judicial police.

The care of the poor is entrusted to boards of guardians having jurisdiction over districts known as unions which have no relation to the territorial district of the city. The guardians from the urban portions of these districts are elected at special elections by the municipal voters of those portions.

The judicial police—that is, the police courts—is not, aside from exceptional cases—of which Glasgow is one—in the hands of the city councils. As a rule the Crown appoints police justices who are persons either not learned in the law and called justices of the peace, or learned in the law and known as stipendiary magistrates and salaried recorders. The justices of the peace receive no salary, but the magistrates and recorders, as their official titles indicate, are remunerated.

The men who serve as justices of the peace, magistrates or recorders, occupy a comparatively high position in the community. Indeed, the right to put the letters "J. P." after one's name is an honor that is much sought after. As a result of this arrangement, petty criminal justice is administered in British cities by men of standing in the community and has rarely been accompanied by scandal. When it is remembered what an important influence on local politics the administration of police justice can be made to exert we can at once see how fortunate British cities are in possessing police magistracy of almost uniformly high standing. The only serious criticism which is made of the British police courts is that their sentences are unduly severe, particularly in the case of misdemeanors which are especially offensive to the wealthier classes.

Before concluding what is to be said relative to the organization of the British city, attention should be called to the composition and character of the committees which manage the various branches of municipal administration, a function performed in American cities by the heads of the executive departments. Somewhat the same characteristics are here to be noticed as in the case of the council. Thus the Tramways Committee of Liverpool consists of 18 members, 16 of whom live outside the wards they represent, 7 residing in the suburbs and 5 in the aristocratic wards. Of the 11 members of this committee who nominally represent the working class wards, only one lives in the ward he represents. The Committee on Electric Light and Power has 16 members, of whom only 7 live in the wards they represent, each happening to be an aristocratic ward. The other nine members are non-residents of the wards they represent and 5 of the 9 live in the suburbs. There are 5 labor wards represented in this committee, and each of the members representing these wards lives outside the ward he represents, either in the suburbs or in the aristocratic wards.

The committees of the Birmingham Council have a smaller number of members than the committees of other British councils. Thus, the Gas Committee has but 8 members. Of these only one lives in the ward he represents, and 6 live outside of the corporate limits in the aristocratic suburb of Edgbaston. Only 2 members live in the city. Every one of these 8 members represents a strictly working class ward. In detail the committee is composed of the following persons: First, the chairman, who is also chairman of the Birmingham Small Arms Company, Limited—one of the largest commercial enterprises in the city—a director of a local bank, and of several other companies, and is engaged in the manufacture of metal goods. He has been a member of the Gas Committee for thirteen years. He lives in the suburbs. Second, an alderman who was for many years a successful manufacturer in the city, but has retired from business. He has been a member of the Gas Committee twenty-eight years and chairman three years. He also lives in the suburbs. Third, an alderman who is a retired manufacturer of chemicals and has served on the committee for five years and lives in the suburbs. Fourth, an alderman who is on the directorate of one of the largest iron and steel tube firms in Great Britain. He has been a member of the committee fifteen years and also lives in the suburbs. Fifth, a councillor who is a successful glass manufacturer and has been on the committee for ten years. He also lives in the suburbs. Sixth, a councillor who is secretary of the Tin Plate Workers' Trade Union, and has been on the committee sixteen years. He also lives in the suburbs. Seventh, a councillor who is an operative brass founder, and has been on the committee five years.

In Glasgow a standing order of the council requires that 9 of the 24 committees shall be "ward committees;" that is, shall consist of 26 elected members, one member to be elected from each ward. Among the committees thus constituted are those of Gas,

Electricity and Tramways. Notwithstanding the policy of making these committees representative of all the wards, 21 members of the Tramways Committee, 14 of the Gas Committee and 17 of the Electricity Committee live outside the wards they nominally represent. Of the 14 members of the strictly working class wards, twelve on the Tramways Committee, including the chairman, 9 on the Gas Committee and 12 on the Electricity Committee live outside the wards they represent.

The result of the composition and character of these various committees is that just as the general supervision and management of the city business which is vested in the council is in the hands of the well-to-do classes, so the detailed management and daily conduct of those public utilities the operation of which the city has assumed is attended to by men of large business experience and of more than average wealth.

The kind of organization which the British city possesses and the comparatively aristocratic character of its institutions to which attention has been called are without doubt attributable in some degree at least to the great homogeneity of the people, which, apart from London, offers a great contrast to the conditions obtaining in the United States. Great Britain has not, as has the United States for the last century or more, been the goal of the oppressed and afflicted of all nations. The result is the presence in the country of a population speaking the same language, brought up from their youth with the same ideas of right and wrong and therefore capable with little conscious effort of greater social co-operation than is the case in the United States. Consequently there is less diversity of opinion than in this country as to the proper sphere of city government, less variation in the methods which are believed to be the proper ones by means of which to secure the objects sought and a more intelligent appreciation of the difficulties with which the attainment of efficient and upright municipal government is beset.

Such are the political conditions of the British municipality and their social basis and such is the municipal organization which has been built upon them. We may well now ask the question: How does the British system of city government work?

In answering this question we may say, in the first place, that municipal politics are separated from and independent of imperial politics. It is true that municipal elections, although held on different dates from imperial elections, are usually affected by considerations of imperial politics; that is, the councils are elected with reference to political lines. But once elected, councilmen seldom permit political considerations to influence their actions. Thus, it is not infrequently the case that a Liberal council, for example, will elect as aldermen men of the opposite political party who as candidates were defeated at the election for the council or who could not have been elected had they been nominated. In Birmingham, for instance, 5 of the 18 aldermen are Liberals, while 40 of the 54 councillors are Tories or Unionists. Municipal questions can be and are, therefore, considered and decided on their merits,

little if at all influenced by considerations of imperial politics. But the administration of local affairs is not only divorced from national politics; it is as well divorced from local politics. That is, the members of the council do not make use of the powers which under the law they possess over the civil service of the city to further their own political ambitions or the interests of the party to which they belong. This is true notwithstanding the fact that as members of the council committees they may be the immediate superiors of a large force of subordinates. Such a thing as the spoils system is unknown to British municipal politics. This is the more noteworthy inasmuch as there is no such thing as a civil service law limiting the power or discretion of the appointing officers. This statement is true not only of the distinctly subordinate officers, but it is also true of the higher officers.

Although the council committees are made up after each annual municipal election and their term of service is therefore only a year, good committeemen are frequently re-elected by the council. Thus, in Glasgow 9 of the present committeemen have served two years; 7, three years; 8, four years; 6, five years; 9, six years; 1, seven years; 1, eight years; 1, nine years; 3, ten years; 2, eleven years; 2, twelve years; 1, thirteen years; 1, fourteen years; 7, fifteen years; 2, eighteen years; 2, twenty years; 3, twenty-one years; 2, twenty-four years, and 3, twenty-five years.

Furthermore, in the selection of the most important subordinates, such as general managers of the various municipal undertakings under the control of the council, the councils and their committees adopt the methods which are commonly adopted in this country by those in charge of large business undertakings, methods which, however, are seldom followed by those on this side of the water in charge of the city government. When a position of importance is to be filled, inquiry is made for the man best fitted for the position, advertisements are even inserted in the technical publications and the result of the inquiry will often be the selection of a man occupying a similar position in another city who has made a reputation as an able manager.

A characteristic example of the application of business methods to city government is to be found in the cases where the cities have entered upon a policy of municipal ownership and operation of public utilities. Municipal accounts are so kept that each undertaking is debited with the expenses which it has incurred and credited with the amounts due for services which it has rendered, the same as if it were operated by a private company. Thus, a municipal gas or electric light undertaking pays the taxes which a private company would have to pay were it operating the particular undertaking, and receives payment for street lighting. In this way the real financial results of the undertaking may be known. It is of course true that some departures are made in practice from the methods which theoretically prevail. Thus, in some instances, it is unquestionable that cities have swelled the receipts of some particular branch of the city government by

charging some other branch of the city government an unjustifiably large price for the service rendered. This is true, for example, of Manchester, where the receipts of the electric light committee are swollen by charging the tramways committee unduly large prices for the electric current which it uses for its tramway lines. This is also true of some of the metropolitan boroughs of London which operate their own electric lighting plants. They receive an improper price for lighting the streets, and thus make the success of their electric lighting enterprises appear greater than it really is.

Because of its methods of conducting municipal administration, Great Britain has conditions existing which are favorable to efficient management. They go far toward explaining the character of the service rendered by the cities which have undertaken the management of certain public utilities.

The management of British cities is characterized not only by the degree of efficiency attained, but it is also commonly free from even insinuations of graft or corruption on the part of public officers. Public opinion is also so alert that actions which in some countries are regarded as harmless, though perhaps not indicative of a delicate sense of honor, are considered as disqualifying for a public career. Thus, in one British city a councillor was discovered to have purchased land which would be benefited by the opening of a street. A long minute was spread upon the record of the council, indicating its disapproval of such action on the part of the councillors, and the man about whom this minute was written disappeared from public life. It should be said, however, that the law of libel is administered by the courts with such severity that criticisms of public officials which are not based on legal evidence are extremely dangerous to make. The freedom of utterance which is characteristic of the American press is not to be noticed in Great Britain, and on that account it is possible that abuses exist which are not brought to the attention of the public.

For these reasons there are practically no reports current as to the evil conduct even on the part of police officers, or if such reports do become current steps are at once taken to remove from participation in the city government those to whom they relate. Thus, not long ago stories were persistently circulated with regard to the relations of the head of the police in one of the large cities with liquor sellers, gamblers and the keepers of disorderly houses. The council took the matter up at once and dismissed the offending officer. Undoubtedly the good character of the police is due in some measure to the supervision exercised over all city police by the Home Secretary of the imperial government, as well as to the excellence of the police magistrates, who, as well as the council committee having charge of the police, may dismiss police constables from office; but it is unquestionably true that in large degree the good character of the police officers is also due to the generally efficient and upright administration of city affairs,

for which the distinctly local body—the city council—is responsible.

Because of this belief that the British have in the excellence of their city governments, we do not find commonly in Great Britain the associations of tax payers and citizens' unions which have been organized so universally in the cities of the United States. Of late years, however, in Glasgow and London, a number of such associations have been formed, their main purpose being to oppose the policy of municipalization which has been adopted along so many lines by these cities. In Glasgow, for example, we find an interesting institution in the ward committees, as they are called, which have been in existence for many years. These are purely voluntary, non-political associations, not recognized in the law. They had somewhat fallen into abeyance until the Citizens' Union, some eight years since, set about strengthening them and endeavoring to utilize them against the policy of further municipalization. These ward committees are elected by show of hands at a ward meeting of the electors in the wards. They take up all matters of interest to the ward, such as improvements, street widening, sanitation, tramway, gas and electric service and supply, and they adopt resolutions and address identical letters to the councillors representing the ward.

There is, however, another class of associations which have arisen in recent years as a means of opposition to the policy of municipalization. These are the "rate payers'" associations. In Glasgow there are two branches of this form of association, namely, the Rate Payers' Federation and the Citizens' Union. They are composed of the same individuals, with their offices in common, but with separate secretaries. Their only difference is that the one, the Citizens' Union, is organized to combat municipalization through politics and agitation, while the other, the Rate Payers' Federation, is organized to oppose the policy in Parliament and in the courts. The membership of the Rate Payers' Federation is kept secret, but it is incorporated and employs legal and other expert talent as needed.

The policy of these associations as stated by their secretaries has not been to oppose the municipalization of tramways, gas, electric and water supply—indeed, they have no criticisms to make on the administration of these enterprises in Glasgow when confined to their proper spheres. At the time when the Citizens' Union was organized, in 1898, the Socialistic program was in full swing, and there were propositions seriously considered by the council of extending municipal ownership further to housing, banking, insurance, cemeteries, tailoring, baking and so on. It was these extensions that the union was organized to combat. They also opposed the gas and electric undertakings in their plan of enlarging their field to take in the supply of gas and electric fixtures, and were successful in the case of electric fixtures, but they came too late in the field to prevent driving the private traders out of the supply of gas fixtures. They also opposed the extension of the tram-

way system to the suburbs until such time as the shortage of facilities within the boundaries of the city itself was overcome. This shortage has now been made good, and several suburban extensions have been made, but in the case of one, that to Milngavie, the Rate Payers' Federation secured an injunction which, up to the present time, has prevented its completion. The Citizens' Union has also opposed the Tramways Committee in its efforts to keep heavy traffic off the tracks to the detriment of horses and business traffic.

The Citizens' Union has taken an active part in resuscitating the ward committees in Glasgow and arousing the interest of the citizens in the management of the municipality. It publishes a year book for the use of the citizens and the encouragement of ward committees, and it states that the alarming indifference to municipal affairs which it found in 1898, and which was taken advantage of by the Socialists, has now been displaced by an intelligent, active and widespread interest.

The following is the program of the Citizens' Union, as printed in its Year Book, 1906:

The Citizens' Union approves of—

1. Economy and the Reduction of Taxation.
2. Limitation of the City Debt in proportion to the Assessable Rental.
3. Appointment of Public Auditors by the Secretary for Scotland.
4. Organization of Corporation Departments so as to avoid overlapping and promote co-operation.
5. Appointment of Stipendiary Magistrates.
6. Compliance with the 1897 Act, which limits corporation housing to the poorest classes.
7. Corporation encouragement of private enterprises to provide houses for the laboring classes.
8. All further borrowing and capital expenditures on Telephones to be stopped, and the enterprise sold.
9. A legal register of Streets, in terms of the decision of the seven Scotch Judges, and abandonment of the House of Lords Appeal.
10. Intoxicated persons in the street to be taken charge of by the Police.
11. Better administration of Licensing Laws, and reduction of Licenses in Crowded areas.
12. Valuation by an outside Valuator of the City Improvement Trust Company.
13. Reduction of the large amount held by the City on loan at short notice.
14. The Recommendations of the Housing Commission as to the housing and controlling of the poorest classes.
15. Extension of the Municipal Franchise to Limited Companies, and of the School Board Franchise to Large Firms and Limited Companies who are heavy rate payers.

The Citizens' Union is opposed to—

1. Municipal Socialism and Municipal Trading, unless where some interest common to all Citizens is concerned.
2. The Corporation continuing to hold lands and buildings after it has cleared an insanitary area, or completed an improvement.
3. A Municipal Works Department.

4. The proposed Illegal Register of Streets.
5. Municipal Cemeteries, while the wants of the city are adequately met by private enterprise.
6. Municipal Insurance, while there is healthy competition for Corporation business.
7. Including Rates in Rents under £6, which would enfranchise 10,000 persons who do not at present pay rates.

The Union cannot expect candidates to adopt all the above items, but it is believed they will serve a useful purpose in letting all whom it may concern know what are our general principles.

Outside Glasgow it has not been possible to secure information direct from the officers of Rate Payers' Associations. The only one that seems to have been aggressive is the London Municipal Society, which has such men as the Duke of Norfolk and Lord Avebury (Sir John Lubbock), among its officers or members. The specific objects of this society are, among others, a uniform system of municipal accounts, an audit by qualified and independent auditors, the principle of public control of large communal services as opposed to municipal management, revision of the system of compounding for rates, and the reform of local taxation. In London there are also Rate Payers' Associations in the several boroughs. These associations do not seem to be regarded by the municipal officials with any greater favor in Great Britain than they are regarded in the United States.

To sum up, then, this description of British city government:

In the first place, British city government is aristocratic, while American city government is democratic. As a result, the British city is in the hands of the well-to-do classes; American city government is not.

In the second place, the organization of the British city is simple; the organization of the American city is usually extremely complex. As a consequence the demand on the British voter, although on the average probably as intelligent as the American voter, is less than in this country. Practically the only officer elected by the people each year in Great Britain is the municipal councillor chosen in each ward.

In the third place, municipal government is out of politics, the spoils system is unknown in Great Britain's cities, and conditions are therefore more favorable than in the United States for the development of efficient municipal government.

Finally, the British people are educated to the belief that their city government should be conducted uprightly, honestly and without partisanship, and therefore they demand that their officials shall live up to standards which are higher than are required of city officers in the United States. A higher position in public estimation is accorded than in the United States to city officials. Relatively, those of the higher rank are better paid than in the United States. The salaries they receive and the position they occupy are potent influences in attracting a good class of men to the municipal service.

It is under these conditions that municipal ownership and operation of public utilities has attained the results which have

accompanied it in Great Britain. It is doubtful, to say the least, whether municipal ownership and operation could be expected to attain the same results were the conditions different from what they are now. It is certain that municipal management would be a failure if certain of the conditions were changed. Thus, if the city administration were not divorced from politics, and if the spoils system were permitted to extend its blighting influence over the city administration, it is certain that municipal ownership would, as compared to what it is now, both be inefficient and a source of loss, rather than of profit.

Recognition of these facts does not of course necessitate the conclusion that municipal ownership would be a failure were it adopted in the United States. It only means that if the policy of municipal ownership is entered upon, the conduct of our city governments must submit to a considerable change before that policy can be successful.

THE LABOR REPORT

By J. W. SULLIVAN

My colleague and myself, in closing our joint inquiry as to wages and conditions in the British gas undertakings visited, agree in saying:

"Summarizing what precedes, with the exception of the twelve-hour stations of the South Metropolitan Company, and taking into account the general level of wages in the several localities, it cannot be said that there is any material difference between the public and private undertakings in the wages of stokers or in the average wages of the shift-workers in the retort houses. The differences that occur do not show a prevalence one way or the other, but they tend to follow pretty closely the general level of wages in the locality, irrespective of whether the undertaking is managed by a municipality or by a private company. The case of the twelve-hour shifts of the South Metropolitan Company is peculiar and requires the discussion of another aspect of the question—the amount of work done by the stokers."

Relative to the electricity undertakings, the investigation sums up:

"It has been found impossible to make a satisfactory comparison of the wages paid in electrical undertakings, on account of the wide differences in machinery, equipment, character of work, size of station, range of wages and names of occupations. The subdivisions of labor varies greatly from place to place, and a large establishment with a minute subdivision of specialized workers may have extremely high wages for a few and extremely low for others, although the names of the occupations may be the same as those where the work is less subdivided. A careful examination of different payrolls and different stations, however, leads to the conclusion that, as in the gas undertakings, there is no predominating tendency one way or the other, and the differences depend mainly upon the differences in the general level of the wages of the locality."

The prevailing wage policy in the British municipalized undertakings investigated is, to pay the skilled workmen trade union rates and the unskilled "a minimum wage." The conclusions in the foregoing paragraphs refer to the mechanics and semi-skilled men among the gas and electrical workers. With such exceptions as an alleged overstocking of the works with labor, as at a municipal gas station in Manchester mentioned in the report, and a favoring of hand labor in preference to machine labor, as in the Leicester municipal gas works, skilled or partly skilled labor had about equal chances with the two forms of management, municipal and company. That is, in these two industries, in all but the most poorly paid forms of labor, municipalization has not raised

the wage or workday conditions of the employees above conditions in the private undertakings, the exceptions noted above showing the dubious advantages of possibly providing municipal employees with work at the expense of the community or furnishing them with a leverage for the play of politics.

But with respect to "common, unorganized labor" the investigators found a difference somewhat favorable to British municipal employees. The report cites facts that explain the causes. (1) The municipal laborer is a picked man. (2) This class of labor offers an especial field for the Municipal Employees' Association, the new political trade unionists, and the Socialists and humanitarians of all walks of life who, demanding for labor at least "a living wage," desire to redeem municipal employment from participation in Great Britain's almost universal sweatshop labor market. Steady, ablebodied and capable of exerting on city councils a combined pressure, municipal unskilled laborers, no matter how organized or whether organized at all, obtain better terms than the employing councillors accord to the men they hire in their private capacity for similar work.

Councils recognize a "minimum wage"—a level below which a municipality will not fix any grade of pay. Yet it is to be noted that the percentage of the municipal minimum above "the private minimum," as quoted by the labor investigators, may in some communities signify little more than a comparison between the city's rate for the choice among laborers and the general rate for those private undertakings which employ men in perhaps the least requited of occupations. That is, the municipal laborers, shown by rigid examination as to physique and character to be sound, steady and nearer youth than age, earn more than the mass in the overstocked labor market, including the unreliable, the gray-haired and other classes unqualified for municipal work. On the average the money difference is shown by but a few shillings a week, though in selecting certain extremes for comparison a considerable percentage may be figured out. The widest contrast, at Leicester, 9s., very probably reflects the same influences that sent that city's Socialist representatives to Parliament. In several of the cities visited, indeed perhaps all, certain large private establishments give, in various ways, approximately the same wage terms as the municipality, or even better, as at Cadbury's and Tangey's in Birmingham.

In the case of the South Metropolitan Gas Company of London—to quote an example in which a system has been worked out independently of the leveling-up influences bearing on city governments, the co-operative features of which, examined at such length, do not attract the unqualified admiration of the investigators—this is to be said: Its employees' stock in the company represents a larger sum than is similarly possessed by any equal number of laborers of the class in England, and its provisions for sickness, death and old age are unusual. Ninety odd per cent. of the employees of these works save something. A Labor Liberal

member of Parliament said of the company to one of our committee: "A gas worker can nowhere get a better job." The Co-operative Union accepts the works as a genuine example of co-operation. The shift men where twelve hours are worked themselves adopted that workday by a vote. The company asserts that it never opposed union labor in its mechanical departments, and withdrew its opposition to the gasworkers' union a few years after the strike of 1889.

Turning now to the tramways and light railways, we find 3,400 miles in the United Kingdom, the number operated by all the companies, some 1,500, being less than the mileage owned by a single American company in several instances. The number of miles operated by the seven companies and municipalities investigated by our experts reached perhaps 500, about Boston's mileage. The British tramway wage situation can only be seen correctly in the light of municipal developments out of what were company undertakings, the latter invariably being far different in their status as to property and degree of progress from the street railways of America. No street car undertaking in Great Britain has ever been a "private" enterprise in the sense in which the word is applied in this country. The twenty-one years' term of the franchise, the veto of company petitions by village authorities, the enormous cost of Parliamentary powers and local assents, and various other restrictions non-existent in the United States, shackle and impoverish British tramway company management and consequently forbid an intelligent investigator to employ British example to illustrate possibilities in America through change from private to municipal ownership. British tramways have always been semi-municipal. The English field of tramway exploitation, if common report in Britain is correct, has been occupied by only the most venturesome promoters, and their work has certainly not been ordinarily successful in the development of the industry, as compared with American standards and results. The burdens of the companies have usually permitted them to win only the barest returns by means of "skinning" methods throughout. The largest private British tramways company passed its dividend last July. Whether others of the largest companies will ever meet their obligations is a common doubt. As by the terms of their franchises all English tramway undertakings may be taken over by the municipalities, directors manage their properties with that end in view. While the companies seldom equal average private employers in ability to pay the wages of municipal tramway undertakings, the municipalities investigated by our committee are the most famous scenes of notable attempts at social reform carried on both by the champions of collectivist ownership and humanitarians endeavoring to mitigate the evils of slum life and to lower a general death rate that gave several of the cities in question an unenviable reputation. Higher wages in the municipality's tramways, however, is not the invariable rule. The private Norwich tramways manager showed that the company paid for electrical

workers the same scale as the city, and in some grades claimed 20 per cent. higher than Ipswich, Yarmouth and Lowestoft. It is to be kept in mind also that usually only the most promising undertakings have been taken over by the cities. As a result, chiefly during the transition from horse to electric traction, British municipalities have established a lead as to wages and workday, but by no means a notable lead, and one not yet finally established. Compared, however, with the remarkable changes for the better in wages and hours in the American street car industry under companies and trade unionism, the best of the British municipal labor improvements seem hardly more than trivial.

Little attention has been given in the report to the class of British municipalizers who, with indefinite plans and revolutionary principles, would carry municipal ownership into fields wherever, in their optimism, they imagine promise of a speedy remedy for civic abuses or economic betterment for the masses. If any of the utopian schemes of these municipalizers had still bid fair to be fulfilled, doubtless the facts would have been given passing recognition and the hopeful outlook touched upon. Space would have been given to any probability of paying new ventures springing out of tried and successful ones. Omission to do so is at least to be noted. Rather are there indications in the report that the tide in practical municipalization is turned. Where advocates once looked for a constant expansion, this has been arrested by disillusion. Government ownership of undertakings of electricity and light railways covering supra-municipal areas may be called for, but there the practical political leaders show a disposition to halt. With regard to municipal lodgings, steamboats and miscellaneous supplies, there has been reaction. Platfrom demands may be more numerous than ever with extremely radical theorists who have the ear of the clamorous among the hungry masses, but the recent elections have gone against the radical sentiment, and appropriations from councils and Parliament are commonly expected to cease or follow slowly.

To put the foregoing points broadly, these are the general labor results of municipalization in Great Britain:

(1) The wage level among municipal mechanics and other skilled men varies little if any from the trade union scale, as paid in the private undertakings. (2) For common municipal labor the wages and workday are better than for the average of private labor, the difference being due to several causes, among them the individual superiority of the picked municipal men and the influence of collectivism, humanitarianism and socialist politics. (3) Industries once marked out by British municipalizers as areas for municipal employment are now given up by their practical leaders.

In America, the municipalized enterprises visited by our labor investigators have been rich mines for significant facts relating to politics rather than to labor. These facts are not usually among those heretofore emphasized by the American advocates of municipal ownership. The testimony as to political rottenness, root and

branch, in Syracuse, Allegheny and Wheeling is conclusive. The municipal plants examined in these cities, it is to be remembered, were selected as models by representative municipalizers of the Commission. Nor is the politico-labor situation in Detroit, Cleveland, Chicago or Richmond at all settled as well as it might be. Just which of the secretaries and superintendents at Detroit in the thirteen years have been purely political appointments, just how many of the trustees have been put on the commission to serve special interests rather than the community, just to what degree organized labor has employed coercion with the mayor, and just how much of an electrician the superintendent of electricity ought to be—fierce argument over such points, as well as the actual cost per light, have kept Detroit in the heat of debate ever since the public electricity station was established. In Cleveland, the present mayor in the beginning increased his reform forces in the public water department so as to strengthen his vote in the primaries—an act possible at all times also under the next and succeeding administrations, which may be bad where the present is good. The degree of purity attained by the present administration is attributable to the officials and the public sentiment aroused, and not to municipalization. In Chicago, where civil service is ironclad, the appointment by the mayor of department heads and even of the Civil Service Commission itself, has more than once proved a vulnerable point in the civic armor, with sad results. In Detroit, Cleveland or Chicago the stability of the municipally operated enterprises rests largely on the mayor, who, however personally estimable and statesmanlike, necessarily becomes as a candidate a relatively good or bad politician, representing for a brief term a policy that may change with his successor. It is plain that in this political situation the resultant labor problem is most difficult. An employee can only hold office in uncertainty, with its consequent evils. He knows not what a coming term will bring. This form of disquiet is not usual in private employment. That it exists in Great Britain among municipal works managers is a certainty. The foremost operating official in one of the largest private tramways said: "I would not be a manager for a corporation" (municipality). A civil engineer told one of our committeemen: "Many managers for corporations seek to get away by finding company positions."

As to Richmond, its exclusion of black men suggests a burning race question indeed, North and South, were municipalization generally adopted and Richmond's example in that respect followed. That feature vitiates any inferences as to the labor problem that otherwise might be made with the Richmond gas works as a basis. To institute a comparison with Atlanta and reach conclusions relating to wages in municipal *vs.* private plants, while ignoring the real and obvious factor in the retort-house wage differences—the race question—would be simply to fail to record all the truth.

Many municipalizers, as did the Populists, vigorously uphold the theory that the root of the evils connected with municipal administration in America is found in the money power seeking franchises. While anti-municipal reformers are endeavoring to strip this power of any sinister influence it possesses by refining the provisions for the regulation of franchise grants to the point that will leave no more than rightful returns for investments, the municipalizers assert that this harmful power is the main prop of the political machine and that the voters can only protect the municipality against it and reduce the machine to a skeleton through municipal ownership. The point is not to be enlarged on here that thereby they might but erect in the end a hundred fold more harmful machinery; or that they have set out with an exaggerated notion of the present-day necessity of corporations to struggle for further franchise grants, and also an inadequate appreciation of certain elements of the machine, such as the purchaseable vote, and of its varied sources of revenue, such as the numerous Federal, State and local offices, elective or appointive, usually for short terms; the host of public contractors; the "outs" as well as the "ins" among the politicians; the liquor interest, with a politician dealer in every election district; the police; the real estate and other speculators and even ordinary business men who receive bosses' notices to help in campaigns. Rather, the point necessary first to decide is whether the bosses blackmail the capitalist investors, as they do all others they can reach, or whether the capitalists maintain franchise-getting bosses as their tools. The municipalizers who believe that the capitalists are the instigators in the game naturally are alive to find facts to confirm their suspicions—yet every one knows that such facts are most difficult to establish. Political campaigns abound in rumors, with what bases all may guess and few know. A little time spent by an investigator in any community in America may yield him whispers derogatory to almost every man of the locality ever in politics. To sift this backstairs and darkroom talk down to substantial truth is a task seldom carried out. The characterless politician who declares that he himself helped to extort bribery money from corporations or handled enforced contributions is a knave not to be believed. One can build any theory on such evidence as his gossip. Notes taken of even the confidential revelations of good men with strong political bias may lead to conclusions regarding certain city councils or certain evil social tendencies which remain sound until flatly contradicted by men equally virtuous and equally positive. The hunt is every man's. In America the hunt is livelier and the game more plentiful than in Britain.

So numerous and so signal are other differences, political and economic, between labor conditions in Great Britain and America, that to summarize them here would prove a formidable task. They are outlined in Professor Goodnow's "British Municipality," and in the labor investigators' "Suffrage," "Working Class Conditions," and "Labor and Politics." One who has read these chapters can

never again freely employ British municipal developments in ownership and operation, whatever their effects, as precedents easily to be imitated in America. The British municipalization movement is shown as originating in social conditions—even to the working-class death rate—utterly removed from conditions in this country. Possibilities for the masses were not the same, the voting power differs, the steps to be taken here could not be similar to those taken there, and the status now arrived at and the results in view in Britain differ, to a degree no one can with any certainty estimate, from what is probable in America.

Any advantage in wages or hours to be figured out for the municipal enterprises investigated in America over the private ones compared with them look much like stale illustrations of the soft berths to be found in public employment. To what extent the jobs are political for the employees, singly or collectively, or a bid for the labor vote is constantly a question. On this point my colleague aptly says: "In the municipal undertakings a larger proportion of the positions are likely to be semi-political." In Chicago one of the union secretaries, in speaking of the city officials granting the union scale, avowed: "We tell them, 'These are our rates'; they're politicians, and they know what to do." When the secretary of the Wheeling gas trustees was asked: "Who fixes the wages and conditions at the works?" his reply was: "The men!" He described their strikes as not trade union but political, connived at by council members and other city officials. In Syracuse the two-dollar rate to laborers goes notoriously to political workers. The disclosures of political rule at Syracuse, Allegheny and Wheeling would make it a mockery of scientific observation to ascribe the high wages for laborers in those municipal undertakings to the "virtues" of municipal ownership. A summary of minimum wage comparisons between private and municipal enterprises must call for many modifications. First, it is to be remembered that the "minimum" of private wages is not the standard of private wages in a community, but the lowest point for the poorest paid class in particular enterprises. A comparison of the various private and municipal classifications up to the highest is not possible, inasmuch as the forces of the large companies are subdivided in finer gradations than the comparatively small forces of the municipalities. Practical men will derive their impressions on this point from our wage tables. A correct view, then, takes in these points: Syracuse, the wages situation politically debauched; Wheeling, the same; Allegheny, the same, to an extent that when a difference of 50 to 100 per cent. in favor of municipalization is soberly computed by one man it makes another laugh. Detroit, private and municipal plants but a shade difference. Cleveland, nine hours municipal as against ten in the general labor market, wages the same. Indianapolis, no municipal undertakings, the rate quoted being for the public departments, for which much of the work is irregular; the water company pays nearly all its laborers $1.75. Chicago, the words "minimum wages" here obtain so

great a significance that, if the tabular statements were not at hand as a corrective, a generally erroneous impression of the average wages paid by the companies investigated might be derived. Of 252 laborers, less than one-fourth are paid as low as $1.75 per day, and these could not pass the city's civil service examination. Ten hours is the exception with the companies' employees. The Chicago firemen in the fire department do not receive union rates. New Haven, no municipal undertaking; hours, eight, public departments, as against nine water works. Richmond-Atlanta, where white as against black labor is employed, economic comparison gives way to race comparison. Philadelphia, United Gas Improvement Company, better wages and hours than any city department, and a reduction from twelve-hour shifts under municipal operation to eight under the company with higher wages. Further points to be kept in view: With the companies mentioned, many times more hands are employed than with the municipalities; good men have been more certain of retaining their places; the employees pay no political assessments and are otherwise politically free; they work under better conditions as to comfort and future prospects.

Up to this stage of our survey, the showing of exceptional benefits to the wage workers employed by British or American municipalities, where any whatever have appeared, has been attended with a showing of positive detriment in so many respects as to give a picture in striking contrast with that usually heretofore exhibited to the world by municipalizers.

Passing from the pure wage and workday phase of our study, we have to record certain fundamental differences between public and private employment always observable to a greater or less extent, and with regard to which the labor report offers testimony, direct or indirect. These differences exist from the point of view of the employer, the employee and society. Being differences of kind, they do not depend on the attitude of passing administrations or individual managers.

The relations between the private employer and his employee are simple. If the employer pays the wages and the employee turns out the work agreed upon, the parties are quits as to business. If the two supplement business with kindly sentiments, the way is clear to promote the happiness of both, in word and deed. This principle runs good in the largest service, as to the head or his representatives face to face with the force. The trade union in its simple form does not aim to change this relation. It would establish minimum wages and hours and a standard of working conditions, but leave the employer free in hiring and discharging, under the trade agreement provisions, and the employee also free aside from his union ties. But public employment, not to speak of its rigidity of forms and methods, its faults of delay and oversight, gives rise, partly through politics but especially through its essentials of authority and restraint, to a maze of complications. Some of these, and their hurtfulness, as illustrated by facts in the labor report, call for mention.

Public employees, frequently against their will, under duress from officials who may injure them, promote by election contributions the fortunes of certain men and parties, though at heart they may be opposed to both. With these employees, violation of manly principle and dishonor to the State are secondary to holding their places. In Detroit, the "yellow assessment book" is passed around in all the city departments except that of electricity, in which, however, only a few years ago it was also circulated. In Wheeling, the smallest officeholder who fails to pay his political assessment is speedily dislodged. In Syracuse, where "even the scrubwomen" are assessed by the party in power, it was said that a proceeding not unheard of was a subscription by an official to both parties. In Allegheny, the one body of workmen who, through their union, refused to contribute to campaign funds, were punished by an increase of work at no higher pay. In London, it was but an enforced party contribution when at one of his meetings the opponents of Lord Avebury packed the gallery with municipal employees "to shout so as not a word could be heard." The conditions for coercion may exist even where it is not exerted for the time being. In Chicago and Cleveland the heads of departments, always active supporters of their respective mayor's political policy, must when ordered, to the extent possible, introduce politics or vacate office. In Detroit, a man whose appointment was of "a distinctly political character," was for years "the dominating figure" in the Public Lighting Commission, and that may be the case again. Neither the acts nor the conditions just described are characteristic of private employment. And they are clearly not of a kind out of which develops the independent citizenship upon which free institutions are to rest.

The executive—mayor, councilman or department head—not only in appointing but in promoting or dismissing employees is exposed to partisan, personal, social or other pressure. Of the British cities visited, partisanship in this respect was least disguised in London, but in several others "lines to councillors," by obtaining for applicants the printed forms, could insure them the first necessary step toward a hearing. In Glasgow, Sheffield and Leicester this practice interfered with the fair play due all citizens seeking work. A few years ago foisting a body of incompetents on a city's payroll was more common in Great Britain than at present; the wave of municipal reform and the revolt of the wage workers served for a time to suppress this custom; but whether the betterment is to be permanent or the same abuses are not creeping in under new forms are fears now given common expression. In machine ruled American cities the spoils system gives to the party in power the right to fill all the offices; even in the better governed cities a change of administration brings good reason for uneasiness to all employees not fully protected by law. Municipal employment as a consequence can rarely attract the same class of upright, self-respecting, capable wage workers as private employment. Here is a fact of grave import in its social significance, and it is of a

scope as wide as the labor market. It reveals one valid reason why the people the least governed are the best governed.

Municipal employees directly, and the employed class in general only less immediately, may undermine the integrity of the employing city official. The Municipal Employees' Association of Great Britain, whose members "do not vote" for candidates that decline to comply with their demands, is the prototype of combinations sure to be formed with more or less definiteness wherever the ballot may be used as a bludgeon. Exposed to this menace, a municipal councillor or manager must decide in all his acts with reference not only to his duty but to his fate on election day. Just as he must not defy his party, local or national, and must be aware of injuring other powerful voting elements, he must not offend this or that class of labor. As my colleague truly says: "Municipal employees sooner or later cast their votes for candidates who promise or who have secured a betterment of their condition, regardless of its effect on the enterprise as a whole"—or, it may be added, on the community as a whole. In the minds of most citizens this admission is sufficient to blast any scheme that brings with it a solid band of voters bent not on the common good but their own selfish ends. To gain these they would betray any other cause.

In America, threatening to ruin a party or a candidate in the name of labor seeking justice has long been a move of both true and false labor leaders. The latter have played the game *ad nauseam* in every community, to the disgust and mortification of honest labor men, yet they continue to catch dupes. To dodge the punitive vote of some class, or color, or creed, or nationality that gives strength to a pack of arrant demagogues, the officeholder plays to the galleries, the public teacher with ambitions becomes dumb, and the political organ suppresses news or modifies opinions. The professional labor politician, finding himself possessed of manipulative power, is as liable to attempt to pervert the vote of his union as he would that of any other organization giving him support. Even in unions in which there is no perversion an undue emphasis is at times placed upon the union ballot, through whose strength an unfair profit may be taken from a municipality. On October 10 last the business agent of the building trades unions appeared before a Chicago council committee and said that unless the city agreed to pay double wages for overtime to its employees in the organizations he represented they would refuse to work beyond the regular eight hours, no matter what the emergency. The committee voted to recommend to the council the ordinance providing for double pay. The opposition daily press in consequence had its jeers for the administration, not so much that it was fighting the wage workers as that it recognized the politicians' need of backbone. In recent years in Great Britain the legitimate objects of the old line labor unions have been frequently cast into the shade in view of the possible fruits of election day. Regardless of the hurtful effect on private employment, the leaders of common

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labor have made all that can be squeezed through platform demands from the City Hall the general proposed standard of wages. Unionists opposed to this policy are "obstacles to the welfare of labor." The stronger sentiment for the hour in British labor circles has been voiced in: "Vote with us or you are not a union man"; "Pay an assessment for our labor candidates, or take the consequences." When this is the case the union member who talks and votes as he thinks, if in the minority, takes risks. And therein so far is destruction to independent democracy. Such a situation in any union of Americans would presage its collapse.

The wage worker who reads the labor report cannot but perceive that municipalization in various ways carries perils to the trade union. In the first place, the field for the labor vote manipulator enlarges with municipal employment. But many unionists refuse to be moved about like pawns, and the lukewarm union member declining either to support or to fight the growing strength of pernicious labor politicians has one more reason to drop out of the union should occasion arise. Again, individual unionists at work for municipalities learn to look to politics for help; whole unions do so, as in the case of the British electrical workers, and in so far they are out of the real union movement. They are engrafted political clubs, not trade unions. They carry perversion into the ranks of genuine unionism. Such unions, as my colleague says of the British Municipal Employees' Association, "weaken other unions while building on their support." A British trade union secretary, speaking of unions of city employees, said: "It is not difficult to organize them to get an increase; the trouble is to hold them afterward." Unionism and office holding, even of the pettiest grade, do not fuse. Another source of undermining the union movement lies in such municipal benefit and pension schemes as have forestalled the unionization of both the Glasgow and Liverpool tramway forces. Inevitably, purely trade union organization will be discouraged with the progress of political trade union organization. The national labor movement in Great Britain was perhaps necessarily changed in character for a time through the Taff-Vale decision; a political demonstration was unavoidable; but the ensuing political events, despite voices of warning, carried the unions to a point difficult to distinguish from Socialism. And similarly, the steps beyond a union campaign for municipalization in this country, and a stage of municipalization itself, should this come, cannot be foreseen by American unionists. There might indeed come a glimpse of the wonders of collectivism, but erected on the ruins of unionism.

It may be urged that unions in America have been committed to the support of municipalization, but it is far from being so in the sense that many of the unions have been in Great Britain. It is true that conventions of the American Federation of Labor, while almost unanimously voting down the socialistic element, have passed resolutions approving of municipal ownership and operation of monopolies. It is also true that ten years ago conventions of the Federation indorsed free silver, and it is equally true that the

great industrial centres, strongly unionized, heaped up large majorities against the free silver candidate for the Presidency, and that the issue is now forgotten. Of like significance it was when the delegates to an annual convention of the International Typographical Union voted, 100 to 6, against the referendum in the organization; but the members reversed the delegates by 6 to 1. The broad underlying fact in these reversions of conventions by the membership is that, while American unionists permit their convention delegates an indefinite liberty in passing resolutions, especially if these refer to the generally recognized evils of monopoly, when the question of a practical remedy is voted on at the polls each man acts on his own judgment. The American unions, unlike those of Great Britain, do not support candidates and public officeholders out of their union treasuries. While central labor unions may indorse municipal ownership in the abstract, our investigators found no instance of an American trade union taking an active part in the elections for municipal officers. In New York last year eleven municipal ownership aldermen were elected, but not as trade unionists.

Great Britain's present municipal political conditions have brought about a discussion of the disfranchisement of municipal employees. Sir John Ure Primrose, recent Lord Provost of Glasgow, who presided at one of the meetings attended by our committee, said on a previous occasion: "We have reached a point where we begin to see a danger ahead, and this one which, from what I know of your peculiar political system, is likely to be more threatening to you than to us. This arises out of the building up of a great army of municipal employees." Mr. E. O. Smith, town clerk of Birmingham since 1881, testified before a Parliamentary committee: "I should like to see all corporate employees disfranchised." Sir Thomas Hughes, alderman since 1878, except during his two terms as mayor, said to the same committee: "I have known an instance where combination was the occasion of a very good man being thrown out of his position as a councillor simply because they thought he did not favor" (the municipal employees). "I should gladly welcome" (disfranchisement). Manager Dalrymple of the Glasgow tramways, through conscientious scruples, does not vote. He favors disfranchising public servants, and does not permit tramway employees to take part in municipal politics beyond voting. Lord Stanley, when postmaster general, tried to have Parliament pass a bill disfranchising postmen. He failed of re-election, and the organized postmen speak of having finished his career, unaware that in this boast they apprize the lay citizen of the postmen's adhesion to a bureaucracy apart from the community, with interests of its own. The British way out of the dilemma of an army of public servants become a public menace may be disfranchisement; a like dilemma, and the menace of a similar fate to free wage workers, are yet avoidable in America.

One showing of our labor investigations is a tendency of municipal employees in either country to refuse to enter unions

when nothing is to be gained at once for themselves, or having organized and taken a profit to quit singly or in a body. This comes from the fact that while the union idea is to master the labor market of an occupation and then by strike or negotiation to mark up labor prices, a different idea in time predominantly animates the municipal employee. The minds of his employers, the higher office-holders, being affected by the variety of considerations above noted that do not enter the mind of a private employer, it is for the municipal employee to study those considerations and when they involve political destinies to turn them to his own account. The strike, with the necessary maintenance of trade union machinery, is not so facile and inexpensive as political influence and pressure, with no regular weekly or monthly dues to support the combination exerting them. And why when the political method is operative and promising should the public employee also help carry the union? The gas workers of Wheeling "immediately dropped out of the union" on receiving even less advantages than those the local Trades Assembly was struggling to obtain for them. In this they unknowingly imitated the gas workers of the municipal plant at Rotherham, adjoining Sheffield, who disbanded on obtaining through the laborers' national union officials an advance to an equal footing with the Sheffield Gas Company's men. On this action a Sheffield labor councillor commented: "They can now neither help themselves nor any one else." The Leicester municipal gas workers, when pleaded with by Secretary Will Thorne to pay dues to his union, thus to help their brothers elsewhere, coldly held aloof, gave not a penny, and voted not to organize. Municipal employees are surely in the union movement when they want help, but they may be out of it when called on for help. The promoters of a new union cannot discriminate among the qualified applicants for membership nor shape too definitely the union's own policies. It is not the organizer's fault if employing municipal officials are more easily persuaded to lend a hand than private employers, or if municipal employees on occasions come into the union on a little judicious persuasion with more alacrity than hands who have got along with their employers well for years. And if a stage is early reached at which the union's scale and requirements, as enforced upon the municipality, are so far above the market rates for some grades of skill, and so crude and arbitrary as not to be adaptable to the various special developments of the industry, there will be found outside the organization many men in private employment who by proper management ought to be within. This is by some electrical workers in Chicago described as the union situation there. It would perhaps be to the political interest of the Chicago Edison Company to have a unionized force, but the union's scale is not adapted to the company's forty odd subdivisons of employees. To some extent the same line of reasoning is applicable to other occupations. If the thought is correct, the general trade union movement suffers from whatever is spurious in the municipal employees' unions. The selfishness of the municipal employees in driving the

best bargain for themselves, regardless of the possibilities of a general organization with modified demands, is a fatal flaw in the new unionism. To point to a so-called union force working for a municipaity and a non-union force in the same occupation working for private employers is not a conclusive argument for municipalization to the experienced union man. Every non-union private force is in possible union territory, and once gained the force will most likely be permanently and actually union. And for the promotion of a wholesome, honest and solid unionism a certain opposition by private employers is necessary. It teaches the employer obligation, the non-unionist the benefits of organization in any form, and the unionist the just and practicable limitations of his claims. With an open opposition from private employers, such as exists to-day in the mining industry governed by the trade agreement, the unionists know where they are. With the half-union and half-political patchwork compromise existing between union business agents and municipal officials, the union spokesmen are in a false position, the city officials are usually under suspicion as time-servers, the unions immediately concerned are not in every respect genuine, and the union movement is handicapped.

To some trade union leaders the policy of working up wages by first establishing a high municipal wage rate and then promoting strikes in private employment for the same standard is advanced as one easily worked. It has its limitations, and its steps in practice may be forestalled. Very few classes of wage workers are employed by the city governments. It is not worth while for fifty occupations to take up the political method for the possible benefit of perhaps five. And the masses of the men concerned in private employ will not always permit themselves to be used, as the policy suggests, to run up high wages for a small minority while awaiting a problematical future move on their own behalf. The contracts with individual workmen made by British municipalities and companies defeats the policy wholly in so far as gas and water employees are concerned.

"Open shop" is the inevitable character of municipal, as all other government, employment. Appointments must be possible to all citizens. Union rules and orders must give way in the shop to the law and official decisions. The Miller case of the government printing office at Washington set at rest reasonable doubt on these points, one result recently being the refusal of seventy members of the typographical union in that office to pay the union eight-hour assessment. In the municipal enterprises investigated at Richmond, South Norwalk, Syracuse, Allegheny, Wheeling, Detroit, Cleveland and Chicago the laborers are not organized, while in the mechanical trades both union and non-union men without discrimination hold positions. Through the activity of business agents union men may at some municipal plants obtain a larger proportion of situations that non-union, but rarely can the agent compel the municipal employee, if firmly unwilling, to pay his union dues. By the agitation of central labor unions, groups of municipal employees

may get better terms from a city and then be free to remain apart from the labor movement. In Great Britain, when the mechanics of a city engage in a strike against a lowering of wages, the union municipal employees remain at work, but if the strike is lost their wages are reduced with those of the strikers. In the little South Norwalk, Connecticut, electrical works the non-union hands have been exempted from membership in the Bridgeport union, a course possibly helpful to municipal ownership but if pursued consistently not to trade unionism. These facts, illustrating endless artificial obstacles to unionism in public employ, hardly describe a possible prospect under municipalization for building up in America a united body of wage workers animated with one set of hopes, rules and aims. In fact, the enemies of trade unionism might divide and conquer it through municipal ownership, were the cost not socially prohibitive.

Municipalities are impersonal employers. They operate through mechanisms. Petitions from individual employees, for example, may meet refusal by a reference of the signers to the regulations; those from a body, if recognized at all, must go by way of red tape finally to the power making appropriations. The higher municipal officials can arrange for such matters as the comfort and convenience of employees only as themselves invested with funds and authority, which is rarely the case, or they may affect to sympathize with the members of a force while really plotting against their interests. But the private employer or his representative can be reached directly by the employed and a decision arrived at quickly. In this case the two parties see each other in the open. In kindness or unkindness man faces man. Results of these two forms of relationship between the employer and the employed, municipal and company, as recorded in the labor report, and indeed as observed by our committeemen generally, do not confirm the assertions, so assiduously given circulation by municipalizers, that municipalization has tended to abolish workplace hardships and introduce new comforts in the workingman's life. Usually attempts to "live up to the brag" in Great Britain have been flat failures. At the main Glasgow works, of the day shift of 500 men, but a dozen in the course of the week make use of the shower baths, only a corporal's guard go to the mess room, few enter the reading hall—the structure for these purposes, which stands too far away from the works proper to permit of immediate use, not being provided with necessary conveniences—toweling, means for drying clothes, methods for the care of library matter. At Leicester, but 72 of the 600 employees care enough for the club and recreation hall to pay 2d. a week to enjoy its privileges. The two great gas stations of Birmingham—Saltley and Nechells—have heretofore lacked the common bathing facilities always looked for at gas works. As a rule, however, British workmen have not been taught to expect the same consideration as American. The appearance of new conveniences in recent years at some of the British municipal works has furnished to enthusiastic Fabian writers

the grounds for many praises and ardent hopes for the coming millennial era through their social revolution, but the innovations were merely what has been customary in many American establishments. The welfare works of Great Britain's municipal undertakings, while a shade better than the private, seem to have not been worth any especial notice from our own investigators. When a good word is said for Liverpool's coffee and cake and billiard rooms at one of the car depots, and the tidiness of two or three retiring places at other plants, the subject is quite exhausted. In this country the company plants visited have usually far better methods both for assuaging hardship and encouraging men in self-respect and worthy ambition than the municipal. In Chicago, the Edison Company's close personal relationship with its employees stands in sharp contrast with that municipality's neglect of even decent accommodations for its electrical workers. Mean appointments and dirt are characteristic of Chicago's municipal electric stations. The Edison Company's system of instruction and club-room features has no counterpart in the city's electrical department, while the company's gradation of employees and promotion on merit form a practical civil service that needs no commission with theories and is operative every day in the year.

Something is revealed in the difference in appearance of the men seen about public and private offices and workrooms. "This office," said the chief gas inspector in the Richmond City Hall, "used to be political headquarters. The fellows stood about, or sat on the desks and tables, and had the telephone going all the time. I put up 'walk back' notices, said I meant everybody, and succeeded in a partial reformation." This picture is familiar to every American citizen who has had business at the city hall or court-house. The scramblers for petty offices or short-term jobs between election times hang about to discuss the moves on the political chessboards. Their manners are not the manners of men in private business places. The public office or workroom itself is usually wanting in the cleanliness, furniture and facilities observable in the private. A key here in either case to causes that operate upon efficiency at every stage.

Not one of the British or American municipal plants of any kind presented a systematized combination of features in the form of benefits, education, grading, welfare work, care for the aged, etc., that gave the slightest foundation for the claim of municipalization advocates that with public ownership arise striking evidences of closer sympathetic relations between employer and employed. On the contrary, in reciting the undeniable facts as to the watchfulness of American companies over the health, comfort, technical education and advancement in business of their employees, one's words may be construed as praise where the intent is no more than exact report. The reader is invited to consult our labor statements on these points and form his own judgment. The Chicago Edison Company and the Philadelphia United Gas Improvement Company, each far more extensive than the largest municipal

branch, in Syracuse, Allegheny and Wheeling is conclusive. The municipal plants examined in these cities, it is to be remembered, were selected as models by representative municipalizers of the Commission. Nor is the politico-labor situation in Detroit, Cleveland, Chicago or Richmond at all settled as well as it might be. Just which of the secretaries and superintendents at Detroit in the thirteen years have been purely political appointments, just how many of the trustees have been put on the commission to serve special interests rather than the community, just to what degree organized labor has employed coercion with the mayor, and just how much of an electrician the superintendent of electricity ought to be—fierce argument over such points, as well as the actual cost per light, have kept Detroit in the heat of debate ever since the public electricity station was established. In Cleveland, the present mayor in the beginning increased his reform forces in the public water department so as to strengthen his vote in the primaries—an act possible at all times also under the next and succeeding administrations, which may be bad where the present is good. The degree of purity attained by the present administration is attributable to the officials and the public sentiment aroused, and not to municipalization. In Chicago, where civil service is ironclad, the appointment by the mayor of department heads and even of the Civil Service Commission itself, has more than once proved a vulnerable point in the civic armor, with sad results. In Detroit, Cleveland or Chicago the stability of the municipally operated enterprises rests largely on the mayor, who, however personally estimable and statesmanlike, necessarily becomes as a candidate a relatively good or bad politician, representing for a brief term a policy that may change with his successor. It is plain that in this political situation the resultant labor problem is most difficult. An employee can only hold office in uncertainty, with its consequent evils. He knows not what a coming term will bring. This form of disquiet is not usual in private employment. That it exists in Great Britain among municipal works managers is a certainty. The foremost operating official in one of the largest private tramways said: "I would not be a manager for a corporation" (municipality). A civil engineer told one of our committeemen: "Many managers for corporations seek to get away by finding company positions."

As to Richmond, its exclusion of black men suggests a burning race question indeed, North and South, were municipalization generally adopted and Richmond's example in that respect followed. That feature vitiates any inferences as to the labor problem that otherwise might be made with the Richmond gas works as a basis. To institute a comparison with Atlanta and reach conclusions relating to wages in municipal *vs.* private plants, while ignoring the real and obvious factor in the retort-house wage differences—the race question—would be simply to fail to record all the truth.

Many municipalizers, as did the Populists, vigorously uphold the theory that the root of the evils connected with municipal administration in America is found in the money power seeking franchises. While anti-municipal reformers are endeavoring to strip this power of any sinister influence it possesses by refining the provisions for the regulation of franchise grants to the point that will leave no more than rightful returns for investments, the municipalizers assert that this harmful power is the main prop of the political machine and that the voters can only protect the municipality against it and reduce the machine to a skeleton through municipal ownership. The point is not to be enlarged on here that thereby they might but erect in the end a hundred fold more harmful machinery; or that they have set out with an exaggerated notion of the present-day necessity of corporations to struggle for further franchise grants, and also an inadequate appreciation of certain elements of the machine, such as the purchaseable vote, and of its varied sources of revenue, such as the numerous Federal, State and local offices, elective or appointive, usually for short terms; the host of public contractors; the "outs" as well as the "ins" among the politicians; the liquor interest, with a politician dealer in every election district; the police; the real estate and other speculators and even ordinary business men who receive bosses' notices to help in campaigns. Rather, the point necessary first to decide is whether the bosses blackmail the capitalist investors, as they do all others they can reach, or whether the capitalists maintain franchise-getting bosses as their tools. The municipalizers who believe that the capitalists are the instigators in the game naturally are alive to find facts to confirm their suspicions—yet every one knows that such facts are most difficult to establish. Political campaigns abound in rumors, with what bases all may guess and few know. A little time spent by an investigator in any community in America may yield him whispers derogatory to almost every man of the locality ever in politics. To sift this backstairs and darkroom talk down to substantial truth is a task seldom carried out. The characterless politician who declares that he himself helped to extort bribery money from corporations or handled enforced contributions is a knave not to be believed. One can build any theory on such evidence as his gossip. Notes taken of even the confidential revelations of good men with strong political bias may lead to conclusions regarding certain city councils or certain evil social tendencies which remain sound until flatly contradicted by men equally virtuous and equally positive. The hunt is every man's. In America the hunt is livelier and the game more plentiful than in Britain.

So numerous and so signal are other differences, political and economic, between labor conditions in Great Britain and America, that to summarize them here would prove a formidable task. They are outlined in Professor Goodnow's "British Municipality," and in the labor investigators' "Suffrage," "Working Class Conditions," and "Labor and Politics." One who has read these chapters can

never again freely employ British municipal developments in ownership and operation, whatever their effects, as precedents easily to be imitated in America. The British municipalization movement is shown as originating in social conditions—even to the working-class death rate—utterly removed from conditions in this country. Possibilities for the masses were not the same, the voting power differs, the steps to be taken here could not be similar to those taken there, and the status now arrived at and the results in view in Britain differ, to a degree no one can with any certainty estimate, from what is probable in America.

Any advantage in wages or hours to be figured out for the municipal enterprises investigated in America over the private ones compared with them look much like stale illustrations of the soft berths to be found in public employment. To what extent the jobs are political for the employees, singly or collectively, or a bid for the labor vote is constantly a question. On this point my colleague aptly says: "In the municipal undertakings a larger proportion of the positions are likely to be semi-political." In Chicago one of the union secretaries, in speaking of the city officials granting the union scale, avowed: "We tell them, 'These are our rates'; they're politicians, and they know what to do." When the secretary of the Wheeling gas trustees was asked: "Who fixes the wages and conditions at the works?" his reply was: "The men!" He described their strikes as not trade union but political, connived at by council members and other city officials. In Syracuse the two-dollar rate to laborers goes notoriously to political workers. The disclosures of political rule at Syracuse, Allegheny and Wheeling would make it a mockery of scientific observation to ascribe the high wages for laborers in those municipal undertakings to the "virtues" of municipal ownership. A summary of minimum wage comparisons between private and municipal enterprises must call for many modifications. First, it is to be remembered that the "minimum" of private wages is not the standard of private wages in a community, but the lowest point for the poorest paid class in particular enterprises. A comparison of the various private and municipal classifications up to the highest is not possible, inasmuch as the forces of the large companies are subdivided in finer gradations than the comparatively small forces of the municipalities. Practical men will derive their impressions on this point from our wage tables. A correct view, then, takes in these points: Syracuse, the wages situation politically debauched; Wheeling, the same; Allegheny, the same, to an extent that when a difference of 50 to 100 per cent. in favor of municipalization is soberly computed by one man it makes another laugh. Detroit, private and municipal plants but a shade difference. Cleveland, nine hours municipal as against ten in the general labor market, wages the same. Indianapolis, no municipal undertakings, the rate quoted being for the public departments, for which much of the work is irregular; the water company pays nearly all its laborers $1.75. Chicago, the words "minimum wages" here obtain so

great a significance that, if the tabular statements were not at hand as a corrective, a generally erroneous impression of the average wages paid by the companies investigated might be derived. Of 252 laborers, less than one-fourth are paid as low as $1.75 per day, and these could not pass the city's civil service examination. Ten hours is the exception with the companies' employees. The Chicago firemen in the fire department do not receive union rates. New Haven, no municipal undertaking; hours, eight, public departments, as against nine water works. Richmond-Atlanta, where white as against black labor is employed, economic comparison gives way to race comparison. Philadelphia, United Gas Improvement Company, better wages and hours than any city department, and a reduction from twelve-hour shifts under municipal operation to eight under the company with higher wages. Further points to be kept in view: With the companies mentioned, many times more hands are employed than with the municipalities; good men have been more certain of retaining their places; the employees pay no political assessments and are otherwise politically free; they work under better conditions as to comfort and future prospects.

Up to this stage of our survey, the showing of exceptional benefits to the wage workers employed by British or American municipalities, where any whatever have appeared, has been attended with a showing of positive detriment in so many respects as to give a picture in striking contrast with that usually heretofore exhibited to the world by municipalizers.

Passing from the pure wage and workday phase of our study, we have to record certain fundamental differences between public and private employment always observable to a greater or less extent, and with regard to which the labor report offers testimony, direct or indirect. These differences exist from the point of view of the employer, the employee and society. Being differences of kind, they do not depend on the attitude of passing administrations or individual managers.

The relations between the private employer and his employee are simple. If the employer pays the wages and the employee turns out the work agreed upon, the parties are quits as to business. If the two supplement business with kindly sentiments, the way is clear to promote the happiness of both, in word and deed. This principle runs good in the largest service, as to the head or his representatives face to face with the force. The trade union in its simple form does not aim to change this relation. It would establish minimum wages and hours and a standard of working conditions, but leave the employer free in hiring and discharging, under the trade agreement provisions, and the employee also free aside from his union ties. But public employment, not to speak of its rigidity of forms and methods, its faults of delay and oversight, gives rise, partly through politics but especially through its essentials of authority and restraint, to a maze of complications. Some of these, and their hurtfulness, as illustrated by facts in the labor report, call for mention.

Public employees, frequently against their will, under duress from officials who may injure them, promote by election contributions the fortunes of certain men and parties, though at heart they may be opposed to both. With these employees, violation of manly principle and dishonor to the State are secondary to holding their places. In Detroit, the "yellow assessment book" is passed around in all the city departments except that of electricity, in which, however, only a few years ago it was also circulated. In Wheeling, the smallest officeholder who fails to pay his political assessment is speedily dislodged. In Syracuse, where "even the scrubwomen" are assessed by the party in power, it was said that a proceeding not unheard of was a subscription by an official to both parties. In Allegheny, the one body of workmen who, through their union, refused to contribute to campaign funds, were punished by an increase of work at no higher pay. In London, it was but an enforced party contribution when at one of his meetings the opponents of Lord Avebury packed the gallery with municipal employees "to shout so as not a word could be heard." The conditions for coercion may exist even where it is not exerted for the time being. In Chicago and Cleveland the heads of departments, always active supporters of their respective mayor's political policy, must when ordered, to the extent possible, introduce politics or vacate office. In Detroit, a man whose appointment was of "a distinctly political character," was for years "the dominating figure" in the Public Lighting Commission, and that may be the case again. Neither the acts nor the conditions just described are characteristic of private employment. And they are clearly not of a kind out of which develops the independent citizenship upon which free institutions are to rest.

The executive—mayor, councilman or department head—not only in appointing but in promoting or dismissing employees is exposed to partisan, personal, social or other pressure. Of the British cities visited, partisanship in this respect was least disguised in London, but in several others "lines to councillors," by obtaining for applicants the printed forms, could insure them the first necessary step toward a hearing. In Glasgow, Sheffield and Leicester this practice interfered with the fair play due all citizens seeking work. A few years ago foisting a body of incompetents on a city's payroll was more common in Great Britain than at present; the wave of municipal reform and the revolt of the wage workers served for a time to suppress this custom; but whether the betterment is to be permanent or the same abuses are not creeping in under new forms are fears now given common expression. In machine ruled American cities the spoils system gives to the party in power the right to fill all the offices; even in the better governed cities a change of administration brings good reason for uneasiness to all employees not fully protected by law. Municipal employment as a consequence can rarely attract the same class of upright, self-respecting, capable wage workers as private employment. Here is a fact of grave import in its social significance, and it is of a

scope as wide as the labor market. It reveals one valid reason why the people the least governed are the best governed.

Municipal employees directly, and the employed class in general only less immediately, may undermine the integrity of the employing city official. The Municipal Employees' Association of Great Britain, whose members "do not vote" for candidates that decline to comply with their demands, is the prototype of combinations sure to be formed with more or less definiteness wherever the ballot may be used as a bludgeon. Exposed to this menace, a municipal councillor or manager must decide in all his acts with reference not only to his duty but to his fate on election day. Just as he must not defy his party, local or national, and must be aware of injuring other powerful voting elements, he must not offend this or that class of labor. As my colleague truly says: "Municipal employees sooner or later cast their votes for candidates who promise or who have secured a betterment of their condition, regardless of its effect on the enterprise as a whole"—or, it may be added, on the community as a whole. In the minds of most citizens this admission is sufficient to blast any scheme that brings with it a solid band of voters bent not on the common good but their own selfish ends. To gain these they would betray any other cause.

In America, threatening to ruin a party or a candidate in the name of labor seeking justice has long been a move of both true and false labor leaders. The latter have played the game *ad nauseam* in every community, to the disgust and mortification of honest labor men, yet they continue to catch dupes. To dodge the punitive vote of some class, or color, or creed, or nationality that gives strength to a pack of arrant demagogues, the officeholder plays to the galleries, the public teacher with ambitions becomes dumb, and the political organ suppresses news or modifies opinions. The professional labor politician, finding himself possessed of manipulative power, is as liable to attempt to pervert the vote of his union as he would that of any other organization giving him support. Even in unions in which there is no perversion an undue emphasis is at times placed upon the union ballot, through whose strength an unfair profit may be taken from a municipality. On October 10 last the business agent of the building trades unions appeared before a Chieago council committee and said that unless the city agreed to pay double wages for overtime to its employees in the organizations he represented they would refuse to work beyond the regular eight hours, no matter what the emergency. The committee voted to recommend to the council the ordinance providing for double pay. The opposition daily press in consequence had its jeers for the administration, not so much that it was fighting the wage workers as that it recognized the politicians' need of backbone. In recent years in Great Britain the legitimate objects of the old line labor unions have been frequently cast into the shade in view of the possible fruits of election day. Regardless of the hurtful effect on private employment, the leaders of common

labor have made all that can be squeezed through platform demands from the City Hall the general proposed standard of wages. Unionists opposed to this policy are "obstacles to the welfare of labor." The stronger sentiment for the hour in British labor circles has been voiced in: "Vote with us or you are not a union man"; "Pay an assessment for our labor candidates, or take the consequences." When this is the case the union member who talks and votes as he thinks, if in the minority, takes risks. And therein so far is destruction to independent democracy. Such a situation in any union of Americans would presage its collapse.

The wage worker who reads the labor report cannot but perceive that municipalization in various ways carries perils to the trade union. In the first place, the field for the labor vote manipulator enlarges with municipal employment. But many unionists refuse to be moved about like pawns, and the lukewarm union member declining either to support or to fight the growing strength of pernicious labor politicians has one more reason to drop out of the union should occasion arise. Again, individual unionists at work for municipalities learn to look to politics for help; whole unions do so, as in the case of the British electrical workers, and in so far they are out of the real union movement. They are engrafted political clubs, not trade unions. They carry perversion into the ranks of genuine unionism. Such unions, as my colleague says of the British Municipal Employees' Association, "weaken other unions while building on their support." A British trade union secretary, speaking of unions of city employees, said: "It is not difficult to organize them to get an increase; the trouble is to hold them afterward." Unionism and office holding, even of the pettiest grade, do not fuse. Another source of undermining the union movement lies in such municipal benefit and pension schemes as have forestalled the unionization of both the Glasgow and Liverpool tramway forces. Inevitably, purely trade union organization will be discouraged with the progress of political trade union organization. The national labor movement in Great Britain was perhaps necessarily changed in character for a time through the Taff-Vale decision; a political demonstration was unavoidable; but the ensuing political events, despite voices of warning, carried the unions to a point difficult to distinguish from Socialism. And similarly, the steps beyond a union campaign for municipalization in this country, and a stage of municipalization itself, should this come, cannot be foreseen by American unionists. There might indeed come a glimpse of the wonders of collectivism, but erected on the ruins of unionism.

It may be urged that unions in America have been committed to the support of municipalization, but it is far from being so in the sense that many of the unions have been in Great Britain. It is true that conventions of the American Federation of Labor, while almost unanimously voting down the socialistic element, have passed resolutions approving of municipal ownership and operation of monopolies. It is also true that ten years ago conventions of the Federation indorsed free silver, and it is equally true that the

great industrial centres, strongly unionized, heaped up large majorities against the free silver candidate for the Presidency, and that the issue is now forgotten. Of like significance it was when the delegates to an annual convention of the International Typographical Union voted, 100 to 6, against the referendum in the organization; but the members reversed the delegates by 6 to 1. The broad underlying fact in these reversions of conventions by the membership is that, while American unionists permit their convention delegates an indefinite liberty in passing resolutions, especially if these refer to the generally recognized evils of monopoly, when the question of a practical remedy is voted on at the polls each man acts on his own judgment. The American unions, unlike those of Great Britain, do not support candidates and public officeholders out of their union treasuries. While central labor unions may indorse municipal ownership in the abstract, our investigators found no instance of an American trade union taking an active part in the elections for municipal officers. In New York last year eleven municipal ownership aldermen were elected, but not as trade unionists.

Great Britain's present municipal political conditions have brought about a discussion of the disfranchisement of municipal employees. Sir John Ure Primrose, recent Lord Provost of Glasgow, who presided at one of the meetings attended by our committee, said on a previous occasion: "We have reached a point where we begin to see a danger ahead, and this one which, from what I know of your peculiar political system, is likely to be more threatening to you than to us. This arises out of the building up of a great army of municipal employees." Mr. E. O. Smith, town clerk of Birmingham since 1881, testified before a Parliamentary committee: "I should like to see all corporate employees disfranchised." Sir Thomas Hughes, alderman since 1878, except during his two terms as mayor, said to the same committee: "I have known an instance where combination was the occasion of a very good man being thrown out of his position as a councillor simply because they thought he did not favor" (the municipal employees). "I should gladly welcome" (disfranchisement). Manager Dalrymple of the Glasgow tramways, through conscientious scruples, does not vote. He favors disfranchising public servants, and does not permit tramway employees to take part in municipal politics beyond voting. Lord Stanley, when postmaster general, tried to have Parliament pass a bill disfranchising postmen. He failed of re-election, and the organized postmen speak of having finished his career, unaware that in this boast they apprize the lay citizen of the postmen's adhesion to a bureaucracy apart from the community, with interests of its own. The British way out of the dilemma of an army of public servants become a public menace may be disfranchisement; a like dilemma, and the menace of a similar fate to free wage workers, are yet avoidable in America.

One showing of our labor investigations is a tendency of municipal employees in either country to refuse to enter unions

when nothing is to be gained at once for themselves, or having organized and taken a profit to quit singly or in a body. This comes from the fact that while the union idea is to master the labor market of an occupation and then by strike or negotiation to mark up labor prices, a different idea in time predominantly animates the municipal employee. The minds of his employers, the higher office-holders, being affected by the variety of considerations above noted that do not enter the mind of a private employer, it is for the municipal employee to study those considerations and when they involve political destinies to turn them to his own account. The strike, with the necessary maintenance of trade union machinery, is not so facile and inexpensive as political influence and pressure, with no regular weekly or monthly dues to support the combination exerting them. And why when the political method is operative and promising should the public employee also help carry the union? The gas workers of Wheeling "immediately dropped out of the union" on receiving even less advantages than those the local Trades Assembly was struggling to obtain for them. In this they unknowingly imitated the gas workers of the municipal plant at Rotherham, adjoining Sheffield, who disbanded on obtaining through the laborers' national union officials an advance to an equal footing with the Sheffield Gas Company's men. On this action a Sheffield labor councillor commented: "They can now neither help themselves nor any one else." The Leicester municipal gas workers, when pleaded with by Secretary Will Thorne to pay dues to his union, thus to help their brothers elsewhere, coldly held aloof, gave not a penny, and voted not to organize. Municipal employees are surely in the union movement when they want help, but they may be out of it when called on for help. The promoters of a new union cannot discriminate among the qualified applicants for membership nor shape too definitely the union's own policies. It is not the organizer's fault if employing municipal officials are more easily persuaded to lend a hand than private employers, or if municipal employees on occasions come into the union on a little judicious persuasion with more alacrity than hands who have got along with their employers well for years. And if a stage is early reached at which the union's scale and requirements, as enforced upon the municipality, are so far above the market rates for some grades of skill, and so crude and arbitrary as not to be adaptable to the various special developments of the industry, there will be found outside the organization many men in private employment who by proper management ought to be within. This is by some electrical workers in Chicago described as the union situation there. It would perhaps be to the political interest of the Chicago Edison Company to have a unionized force, but the union's scale is not adapted to the company's forty odd subdivisons of employees. To some extent the same line of reasoning is applicable to other occupations. If the thought is correct, the general trade union movement suffers from whatever is spurious in the municipal employees' unions. The selfishness of the municipal employees in driving the

best bargain for themselves, regardless of the possibilities of a general organization with modified demands, is a fatal flaw in the new unionism. To point to a so-called union force working for a municipaity and a non-union force in the same occupation working for private employers is not a conclusive argument for municipalization to the experienced union man. Every non-union private force is in possible union territory, and once gained the force will most likely be permanently and actually union. And for the promotion of a wholesome, honest and solid unionism a certain opposition by private employers is necessary. It teaches the employer obligation, the non-unionist the benefits of organization in any form, and the unionist the just and practicable limitations of his claims. With an open opposition from private employers, such as exists to-day in the mining industry governed by the trade agreement, the unionists know where they are. With the half-union and half-political patchwork compromise existing between union business agents and municipal officials, the union spokesmen are in a false position, the city officials are usually under suspicion as time-servers, the unions immediately concerned are not in every respect genuine, and the union movement is handicapped.

To some trade union leaders the policy of working up wages by first establishing a high municipal wage rate and then promoting strikes in private employment for the same standard is advanced as one easily worked. It has its limitations, and its steps in practice may be forestalled. Very few classes of wage workers are employed by the city governments. It is not worth while for fifty occupations to take up the political method for the possible benefit of perhaps five. And the masses of the men concerned in private employ will not always permit themselves to be used, as the policy suggests, to run up high wages for a small minority while awaiting a problematical future move on their own behalf. The contracts with individual workmen made by British municipalities and companies defeats the policy wholly in so far as gas and water employees are concerned.

"Open shop" is the inevitable character of municipal, as all other government, employment. Appointments must be possible to all citizens. Union rules and orders must give way in the shop to the law and official decisions. The Miller case of the government printing office at Washington set at rest reasonable doubt on these points, one result recently being the refusal of seventy members of the typographical union in that office to pay the union eight-hour assessment. In the municipal enterprises investigated at Richmond, South Norwalk, Syracuse, Allegheny, Wheeling, Detroit, Cleveland and Chicago the laborers are not organized, while in the mechanical trades both union and non-union men without discrimination hold positions. Through the activity of business agents union men may at some municipal plants obtain a larger proportion of situations that non-union, but rarely can the agent compel the municipal employee, if firmly unwilling, to pay his union dues. By the agitation of central labor unions, groups of municipal employees

may get better terms from a city and then be free to remain apart from the labor movement. In Great Britain, when the mechanics of a city engage in a strike against a lowering of wages, the union municipal employees remain at work, but if the strike is lost their wages are reduced with those of the strikers. In the little South Norwalk, Connecticut, electrical works the non-union hands have been exempted from membership in the Bridgeport union, a course possibly helpful to municipal ownership but if pursued consistently not to trade unionism. These facts, illustrating endless artificial obstacles to unionism in public employ, hardly describe a possible prospect under municipalization for building up in America a united body of wage workers animated with one set of hopes, rules and aims. In fact, the enemies of trade unionism might divide and conquer it through municipal ownership, were the cost not socially prohibitive.

Municipalities are impersonal employers. They operate through mechanisms. Petitions from individual employees, for example, may meet refusal by a reference of the signers to the regulations; those from a body, if recognized at all, must go by way of red tape finally to the power making appropriations. The higher municipal officials can arrange for such matters as the comfort and convenience of employees only as themselves invested with funds and authority, which is rarely the case, or they may affect to sympathize with the members of a force while really plotting against their interests. But the private employer or his representative can be reached directly by the employed and a decision arrived at quickly. In this case the two parties see each other in the open. In kindness or unkindness man faces man. Results of these two forms of relationship between the employer and the employed, municipal and company, as recorded in the labor report, and indeed as observed by our committeemen generally, do not confirm the assertions, so assiduously given circulation by municipalizers, that municipalization has tended to abolish workplace hardships and introduce new comforts in the workingman's life. Usually attempts to "live up to the brag" in Great Britain have been flat failures. At the main Glasgow works, of the day shift of 500 men, but a dozen in the course of the week make use of the shower baths, only a corporal's guard go to the mess room, few enter the reading hall—the structure for these purposes, which stands too far away from the works proper to permit of immediate use, not being provided with necessary conveniences—toweling, means for drying clothes, methods for the care of library matter. At Leicester, but 72 of the 600 employees care enough for the club and recreation hall to pay 2d. a week to enjoy its privileges. The two great gas stations of Birmingham—Saltley and Nechells—have heretofore lacked the common bathing facilities always looked for at gas works. As a rule, however, British workmen have not been taught to expect the same consideration as American. The appearance of new conveniences in recent years at some of the British municipal works has furnished to enthusiastic Fabian writers

the grounds for many praises and ardent hopes for the coming millennial era through their social revolution, but the innovations were merely what has been customary in many American establishments. The welfare works of Great Britain's municipal undertakings, while a shade better than the private, seem to have not been worth any especial notice from our own investigators. When a good word is said for Liverpool's coffee and cake and billiard rooms at one of the car depots, and the tidiness of two or three retiring places at other plants, the subject is quite exhausted. In this country the company plants visited have usually far better methods both for assuaging hardship and encouraging men in self-respect and worthy ambition than the municipal. In Chicago, the Edison Company's close personal relationship with its employees stands in sharp contrast with that municipality's neglect of even decent accommodations for its electrical workers. Mean appointments and dirt are characteristic of Chicago's municipal electric stations. The Edison Company's system of instruction and club-room features has no counterpart in the city's electrical department, while the company's gradation of employees and promotion on merit form a practical civil service that needs no commission with theories and is operative every day in the year.

Something is revealed in the difference in appearance of the men seen about public and private offices and workrooms. "This office," said the chief gas inspector in the Richmond City Hall, "used to be political headquarters. The fellows stood about, or sat on the desks and tables, and had the telephone going all the time. I put up 'walk back' notices, said I meant everybody, and succeeded in a partial reformation." This picture is familiar to every American citizen who has had business at the city hall or court-house. The scramblers for petty offices or short-term jobs between election times hang about to discuss the moves on the political chessboards. Their manners are not the manners of men in private business places. The public office or workroom itself is usually wanting in the cleanliness, furniture and facilities observable in the private. A key here in either case to causes that operate upon efficiency at every stage.

Not one of the British or American municipal plants of any kind presented a systematized combination of features in the form of benefits, education, grading, welfare work, care for the aged, etc., that gave the slightest foundation for the claim of municipalization advocates that with public ownership arise striking evidences of closer sympathetic relations between employer and employed. On the contrary, in reciting the undeniable facts as to the watchfulness of American companies over the health, comfort, technical education and advancement in business of their employees, one's words may be construed as praise where the intent is no more than exact report. The reader is invited to consult our labor statements on these points and form his own judgment. The Chicago Edison Company and the Philadelphia United Gas Improvement Company, each far more extensive than the largest municipal

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gas or electric works visited abroad, exhibit both ripened business judgment and strong sentiments of fellowship in numerous forms of care for their employees, whether at work or at play. It is but one's plain duty to call attention also to the exemplary oversight of the Indianapolis Water Company in regard to the material conditions of its force, to the New Haven Company's record for retaining its employees, and to the Atlanta Company's interesting methods of rewards beyond wages. Nor, since our task is a comparison of methods, is it invidious to direct attention to the table of terms of service in the Glasgow municipal tramways, giving color as it does to the assertions of a Glasgow correspondent of the London "Clarion" (Socialist), who wrote, January 19, 1906, that: "Motor men and conductors to be employed on the tramways must produce a five years' reference, but on leaving, unless going abroad, no character is given; that the conductors have to pay the full face value for lost tickets; that the men are supposed to report each other for neglect of duty; that men have been suspended for not wearing the regulation uniform, for punching a ticket in the wrong place, and for numberless trifles which no private employer would think of even checking a man for." This correspondent also called attention to the large number who leave every year, owing to the many petty grievances and irregularity of the hours with which they have to put up. Our investigators' table shows that 1,085 of the 2,433 have less than three years' standing as employees.

The Liverpool municipal tramways service employs no man under the age of thirty years. Glasgow takes on no elderly men as lamplighters, watchmen, etc. Few, if any, of the British undertakings investigated instruct beginners at laboring work. Such facts throw on the municipal "minimum wage" a light different from that in which it stands when the shillings that may be gained under it have isolated mention. The British municipality selects a workman after proof of his character and mental and physical fitness, it hires no aging man, usually obliges the young learner to obtain his knowledge and certificate from a private employer, strictly holds the employee up to discipline, and discharges him by rule and regulation. As little compunction is to be expected as when the city of Glasgow seizes the last stick of furniture of the poor man to satisfy a claim for gas, water or electricity. Herein are many indications that municipal wage rates, including pension schemes, are to a considerable extent but the effect of trade union and labor vote pressure and not of the brotherly feeling of the higher office holders. On the whole, a municipality, British or American, pays the wage the law prescribes and there it stops. Numerous obstacles inherent in public employment stand in the way of having it do more.

The American employee properly infused with our national spirit seeks a career in which he, alike with his fellows, may hope to reap due rewards and suffer just penalties, while retaining in every respect his liberties as a freeman. But the obstacles to this

ideal condition are endless in public employ. As we have seen, it usually offers to the aspirant the vicious spoils system, or in a few cases a schoolboy civil service examination, partly absurd and on occasion humiliating, with the possibility, as a climax of injury, of disfranchisement. The directing administrators of a municipality —mayor, councilmen, department heads—officially, by nature or their terms of service, can promise the employee but short memories, vacillating judgments and varying policies. These deficiencies cannot engender the confidence in his future that puts vim into a man's work. Moreover, in official life but little play is offered for the heart. The usual public expression of indebtedness beyond wages —pensions—is a standing testimony to enormous abuse. In the public service, opportunity to advance even when legally prearranged through examinations systematized and robbed of attraction to versatile mentality and high character, is exposed to influence and political plotting. A public employee without backing may never be given occasion to prove his peculiar abilities; even bare legal recognition of his proper claims may tardily be conceded. The average public employee displays a sufficiently high order of merit to hold his place if he merely follows the code of rules mechanically. To a certain limit he may be slovenly, indolent, ill-natured, unhelpful, selfish, unobliging to the public, and yet incur no punishment. Private employment in general does not develop this character; it rewards ideas, alertness, civility, cleanliness, energy. A force of public employees with rights under the regulations invariably become a band of lay lawyers who know the loopholes of the law favorable to themselves. "Old soldiers," they are capable of violating the spirit while paying it outward deference. Every public employee daily faces the riddle as to where his obligation as the government's man ends and his freedom as a citizen begins; post office employees may not combine and agitate while off duty with a view to an increase in their salaries. Not to give the proposition to disfranchise any weight, the prohibition of pernicious political activity is at once a notice to public employees that they stand in a category apart from citizens in general, a recognition by the community that they live too near power to be trusted, and a warning that the menace that they constitute ought not to be increased. A desirable humanitarianism in public service, such as a maximum annual sick leave, may through perversion become simply an emolument of office; a necessary exercise of preference by superiors, a means of favoritism; a system of promotions on examination, a device to reward spasmodic cramming and defeat sterling every-day capability. The disparities of pay and treatment and length of workday so frequently observed among various classes of public employees illustrate the difficulties of adjusting details through statutes. To organized labor the problem presented by municipal employment through possible falling away of members, misrepresentation by vote hucksters, and the gradual transition from unionism to politics, is rendered the more complicated by the fact that no private blacklist ever instituted has been

so sweeping as that operative through civil service or similar inquisition against a discharged public employee. Once out for cause, to re-enter the public service is a heart-breaking task.

If these observations are true they are proofs that private employment is free from manifold drawbacks that in the public service lower efficiency, form automatons, and discourage a proper and manly self-assertion. To a large extent the various objections noted in this review are stated or suggested in our labor report; and American wage workers already give them wide recognition in practice. Among the more independent there is a large class who consider that precisely as the field of public employment is enlarged—with its age limits, its uncertainties, its unsettled and always doubtful civil service, its asylums for barnacles, its artificial relationships, its unrequited exactions, its inducements to hypocrisy and filchings—the field in which they may find honest work, or any work, is diminished. No man can entertain that view of the extension of private employment, in its variety. There, the more work the more chance for all.

But when all is said on the vexed question of public versus private employment, only a single phase of the workingman's relation to municipalizing has been seen. Not by an enormous percentage is the working class citizenship represented by municipal employees, and not by a considerable percentage even by the trade unionists. A majority of the latter might for a time decide to support municipal ownership and operation and yet come far from truly representing the whole of the workers. This can only be done by the total masses of society who through work of all grades are in the broader sense producers. These have at stake infinitely the greatest interests—political, economic, social. Rarely is this truth accorded its full weight. The eye-glass of political reformers—and men of all parties so consider themselves—is commonly directed alternately on the public employee to ascertain if he has been made better off by municipal experiments on trial, and on the organized mass of wage workers whose votes on an issue may be decisive. While all men feel that the general good is what is meant to be subserved, heated argument over lesser phases is thus the partisan habit. When one reflects on the comprehensive significance of the term "the wage earner" and is told that "the tendency of municipal ownership is to benefit the wage earner more in the United States than in Great Britain" he is struck both with the absurdity of attributing stiff municipal wages to altruistic origins and with the pitiful inadequacy of the descriptive term employed, unless there lurks in it the promise of a paradise when the army of public employees shall be increased without limit.

Another highly important point is often lost to view. Even if the reformer in office is genuine, even if he has a scheme that promises well for the working masses, there arises the question of the duration of his official powers and those of his successors with similar aims, together with the persistence of the public in assiduous attention to its own self-protection. What may be done during

a voters' upheaval is neither a measure of what is possible to public administrations as the decades go by nor a guarantee that the spirit of reform is to have no rest until the last serious grievance is ended. The steady strain on voters, with the distraction of new issues, is heavy. The public-spirited councilmen who planned Richmond's gas enterprise in 1851 provided in the City Code that on February 1 of each year the municipal auditor should ascertain the cost of gas for the previous twelve months and fix its price accordingly for the ensuing twelve. Long ago forgotten by the public, this article is probably unknown at the present time to nearly all the council members. Directly in violation of it, the gas works revenues are regularly used to reduce the local taxes; that is, those citizens who burn gas pay their own taxes and a part of what are justly due from their neighbors. The injustice is yet more flagrant in the case of the black taxpayers who are gas consumers, for their payments help in giving the exclusively white gas employees wages far above the market rate for negroes or even for white men. Thrice removed from privilege, the black gas consumers live on under this outrage, municipal reform asleep. Their burden is not on the scale it might be were Richmond a Glasgow in municipalization, but it has the sanction of time, the community's conscience in this respect fossilized. Birmingham, the birthplace of English municipalization, has exhibited in its gas works from the start a failure to recognize the principle that to take money from the gas consumers in order to reduce the rates is an arbitrary double taxation. Birmingham's minimum wage, the lowest of the larger English cities, comes down near sweatshop levels, and its provisions for the comfort of its gas workers are well-nigh non-existent. A gang of its coke-stackers, cleaning up in the foul works wash room after their day's work, voiced this plaint to several members of our committee: "This is the hardest work in Birmingham, and the poorest paid." Commenting on the $250,000 annually turned into the municipal treasury by the Birmingham works, the Gas Workers' Trade Union secretary said: "The poorest class of workpeople pay an extraordinary price for gas—3s. 2d. (76 cents)—and what the poor burn is the backbone of the industry. Large consumers pay 1s. 7d. (38 cents), medium, 2s. 6d. (60 cents.)" Contrast these various points with the same points as related to Sheffield's gas company. This company sells a better quality of gas than Birmingham at 1s. 1d. (26 cents), to 1s. 6d. (36 cents). Its employees have wages as high as those of Sheffield's municipal employees or higher. Their welfare as workmen is well cared for. The city, although it owns no stock in the company, has its interests guarded by appointing three councilmen members of the board of directors. Birmingham publishes in its reports a table showing the amount of profits paid annually to the city by its gas consumers, amounting in ten years to $2,500,000; the Sheffield Company could well print a table showing, on the basis of the difference between the price of its gas and Birmingham's, how it has saved twice that sum to Sheffield's gas consumers, meantime taking nothing

from the municipality and maintaining an attitude of impartial justice toward all citizens, gas consumers or otherwise. Sheffield and Birmingham thus compared afford an insight into certain peculiar and significant features of municipal and private ownership, not the least of which are the fitfulness of municipalization reform and the permanency in the reforms established by just charter provisions for a company, to the immeasurable benefit of the entire wage working class.

The summing-up questions in our labor inquiry must include, besides those relating strictly to the wages and hours and welfare of the hands: Which, public or private employment, assists in the greater honesty and efficiency of a working force, in the higher development of both specialized knowledge and the spirit of manhood among employees? Which promotes among the masses the more general use of the commodities that are produced? Which, hence, best aids commerce and transportation? Which, while helping to insure the greatest possible volume of consumption, unfailingly stimulates initiative and invention and provides new opportunities for the workers through the advancement of the whole people? Civic adjustments with a view to benefiting labor must have regard to clearing the political and economic field of unnecessary complications, to maintaining the conditions most favorable to technical and general progress, and to achieving results in the highest, broadest and remotest degree conducive to the happiness of every rank of labor. The adjustments, for example, that give us the most widespread use of the best and cheapest gas and electricity, the lowest fares and the speediest transportation on the greatest of electric lines, are those most desirable to the entire population. If such ends are the better attained in free industry, necessarily involving private employment, to continue extending its province becomes one of the higher obligations of society.

On examining municipalization as exhibited in the labor reports, it is seen to be a project to restrict men in their activities by methods foreign to the American genius, while in practice it has failed to make out the case of its advocates as in the least measure a step forward in promoting the best interests of the employees of the enterprises investigated, or of the occupations most closely interwoven with them, or of the nation's breadwinning masses.

WORKING CLASS CONDITIONS.

Many of the striking differences between the United States and Great Britain in labor and social conditions are illustrated in the industries investigated. In the United States there is an absence of many factors which, appearing in the inquiry in Great Britain, possess a significance as to the general political and economic state of the kingdom, and consequently as to tendencies there in attempts at social changes.

There is no Municipal Employees' Association in the United States. The essential object of that organization—pressure on city officials by means of the ballot to control wages and hours—

is usually attained here through the composition and methods of our party machines. It is through them that our officeholders, big and little, and outside organizations, labor and otherwise operate.

In this country a community may have the three interests of local, State, and national politics united in one party executive committee; in Great Britain representative men of all the cities visited denied that any machine whatever in the American sense existed among them. In some of these cities any connection between local and national politics was also disavowed, and even where Councillors were classed as Liberals and Conservatives at election it was asserted that in Council Conservatives at times spoke and acted as Radicals, while Liberals might be as reactionary as the Whigs.

In the United States, there are nowhere such legal restrictions of citizenship as to cut away the laboring class vote by 25 per cent, or at times more, even as high as 40, as in London and Liverpool. Nor does there exist in this country such a relationship between municipality as employer and its wage-workers as to bring up for discussion the disinfranchisement of city employees. There are no multiple voting here on property, no representation by citizens living in territory lying outside the constituency represented, no selection of men of other classes as the official spokesman of the labor element. The American workmen have no conception of the British system of caste. In America there has been no recent upheaval of the working classes resulting in the election of labor representatives in Congress and the City Councils composed of leaders with more or less revolutionary programmes.

The three foregoing paragraphs indicate either that the professional politician of Great Britain has not awakened to his opportunities or that the opportunities do not exist. In either event that country has been barren ground for the boss, the heeler, the gang, and a mass of purchaseable voters represented in legislative bodies by a machine man. Further, our workingmen reformers have a different political outlook before them and different materials to work on from those of the British workingmen reformers.

The relations between trade unions and the municipality differ in the two countries:

In Great Britain a definite policy in dealing with the trade unionists has been adopted by managers of municipal undertakings; in this country, except in Chicago, where some of the objects of the unions are attained in a roundabout manner, the municipalities have given union officers no recognition in negotiating.

In America, neither public nor private managers have put into practice a system of making individual contracts with employees to forestall strikes, as is done in the public Glasgow and the private London South Metropolitan Gas Works; nor in this country has any system of pensioning or labor copartnership been adopted.

In Great Britain whatever important changes in pay and hours have taken place have been in connection with the municipal tramway employees and the most poorly paid laborers protected by the

"minimum wage"; in the United States all the street and interurban railways are owned and operated by companies, under whom marked changes for the better have also taken place, while day laborers' wages, usually double or nearly double those of Great Britain, are little affected by the municipal minimum.

In the municipalities of Great Britain there are no civil service regulations, as in Chicago, nor a general "prevailing rate" law, as in New York and Pennsylvania.

Socialism and trade unionism are closer together in Great Britain than in America.

In America Socialism has had no direct bearing on the development of the municipal enterprises investigated; in Great Britain prominent trade-union Socialists assert that the whole municipal ownership movement of the kingdom has been brought about by Socialist agitation.

Those American trade unions whose ramifications enter into the four industries investigated have no Socialist platforms and publications, as do the unions of the laborers, gas workers and electrical workers of Great Britain. The American labor movement is overwhelmingly embodied in trade-unionism, with first reliance on the strike, a method which has here done the uplifting; the British trade union with respect to its every-day labors is a benefit society, and with respect to its occasional militant efforts is nowadays the main support of Socialistic tendencies. A general strike in recent years has been a rarity.

In education and democracy the American masses are immeasurably ahead.

The British workingman ever since the kingdom's tardy establishment of a school system has been the victim of crude and often sectarian educational methods, the removal of some of its abuses in the course of a series of political campaigns being recently attended with prolonged acrimonious public debate and the display of religious animosities. America long ago settled this question in peace.

In Great Britain, the influences of the outgrown established church, of the feudal-minded nobility, of the bauble-distributing monarchy, and above all of landlordism, constantly irritate, hamper or impoverish the masses. In America no one or two men draw ground rent from half or two-thirds a city or a borough, as do two lords of the kingdom in Liverpool, or the Dukes of Bedford and Westminster in London.

The extremely narrow limits to the opportunities of the masses in Great Britain is to the American observer a fact most striking. Unemployment in America is not condemnation to hopelessness; pauperism is not the common lot of a large percentage of the aged working people.

The objects of trade unionism in the two countries differ:

In Great Britain the composite organization of tramway workers, teamsters and drivers of all sorts has a total membership of only 12,000. In two of the largest municipal un-

dertakings investigated the workmen's organizations are benefit societies under the wing of the managers. The Electrical Workers' Union was called into being to capture the work of contractors on city work; its bond to maintain its continuity is made up of benefits; its organ, pessimistic and visionary in contents, is weighted with the propaganda of Socialism. Among the unskilled, however, mutual benefit trade unionism has made a progress that is illustrated by the existence in the small area of England of five national laborers' organizations, each supporting a staff of general officers. In none of the American enterprises investigated were the laborers organized, a difference in the social composition of the two countries being suggested by the fact that the innumerable American benefit societies are rarely made up on occupational lines and that the feature of paying benefits is by many American union leaders regarded as a drawback to the more profitable venture of striking for higher wages and lower hours. A union without benefits and for striking purposes only would be allowed to languish by the British workers. Their chances for winning strikes are small, unemployment being so general now for years. Their minds are bent on a plodding routine of insurance in a state of chronic distress rather than on mastering the labor market in order to take as a right a larger share of an increasing national production.

British workmen in the mass earn hardly as much money as our Southern negroes:

A wide difference in the standard of earnings for the wage working classes of the United States and Great Britain is indicated in the wage scales of the undertakings investigated in the two countries. In Glasgow the minimum municipal wage, for which thousands are working, is 21s. ($5.09) a week; in Birmingham, 23s. ($5.57); in Liverpool, 24s. ($5.81); in Manchester, 25s. $6.07); in London, 28s. ($6.80). These are the rates up to which the radical reformers in the largest and most advanced cities have pushed the municipal scale for laborers, men without special skill but who are selected after proof of character and capability. The run of the human market, as taken by private employers in general, falls for the same class of laborers to 3s. or even 5s. less per week. But in the company undertakings investigated the average minimum ran little below that of the municipal. The other extreme of the wage range, the maximum, is reached by the trade union scales for skilled mechanics, which settles at 32s. to 34s. a week in Northeastern England, where, except in London, the highest rates are recorded, and only a shade more is earned in London itself. Turning to labor in the American municipal enterprises investigated, we find the lowest point for common white labor at $1.50 to $2 a day in Syracuse, $2.75 in Allegheny, $1.85 in Wheeling, $1.75 in Cleveland, $1.75 in Detroit, $2 in Chicago, and $2 in Richmond. In the private enterprises, the cheapest grade of labor draws $1.75 in Philadelphia, $1.50 in New Haven, $1.60 and $1.80 in Indianapolis, $2 in Chicago, and $1 (negroes) in Atlanta. The weekly range of this grade for the municipalities in Great Britain is from

$5.09 to $6.80; in America from $9 to $12 (omitting the exceptionally high rate of $16.50 in Allegheny). The company range is just the same (omitting the Atlanta rate for negroes). In the United Kingdom the company rate runs better than the municipalities in the gas works at Sheffield and Newcastle and in the South Metropolitan works in London, while it is slightly lower in Norwich and Dublin, with a wider difference between the municipal and company systems in London.

Living is cheaper in Great Britain only when the poor people go without things that all classes of Americans can have.

A member of the Manchester City Council Committee on Tramways, speaking formally at a joint meeting of his committee and the National Civic Federation Committee on Investigation, said that to the working man £1 in England was worth £2 in America, owing to the difference in the cost of living. He repeated a belief common among the uninformed in England.

On this very large subject, the reader is aware, exact facts are frequently elusive, and opinions as to what exhaustive inquiry might elicit may with reason differ. Trustworthy definitive statistics are not to be had. Yet not to publish one's own reading of the simpler facts in view, and not to give one's own conclusions as to the more complex phenomena so far as formed, would leave a duty unfulfilled.

In what is herewith submitted, the reader will discriminate between the facts which are undoubted and the impressions which await correction.

Of the four principal items of the married workingman's outlay, food, rent, clothing and fuel, the first is the most important. It is usually allotted in our National Labor Department tables, on an average, 50 to 65 per cent. of a year's earnings. Exportations of American grain stuffs, meats, etc., to Great Britain, it is plain, can be disposed of in the United States at no more than the British market prices. In other words, if prices were higher in America, the farm products exported would be held here for the home market. To maintain a volume of exportation, the British prices must be the American producer's price plus the costs of resale and shipment to the British merchant. In the first four months of 1906 the United Kingdom imported from America 176,000 head of live cattle, 820,000 hundredweight of beef, 42,000 head of live sheep, 1,500,000 hundredweight of bacon, 400,000 hundredweight of hams, with butter, cheese, and eggs in quantities, and fruit by the shipload. This was not trust-owned output dumped abroad cheap, but commodities sold under competition. The British workingman can obviously in these circumstances not buy these staples of life at lower prices than the American. As a matter of fact, the foods of the British masses, aside from bread, are mostly made up of dried fish, cheap meats, and the common kinds of vegetables. Much the same things go on the table the year round. Fruit is usually dear, even in the short season of the British Isles. In variety, quantity and quality, the articles of food sold to-day in Britain's markets bear no com-

parison with those in the American. The British working classes ordinarily live on the poor grades of the market or go without. As to clothing, whatever verdict might once have been declared off-hand favorable to English goods and make, American observers at present may with reason ask to hear from American clothing and shoe manufacturers on the subject before the question is settled in their minds. Within the last twenty years the improvement in quality of cloth and trimmings, in cut and fit, of the American workingman's clothes has been one of the most notable changes in the outcome of any industry. The suit selling at $20 or more in England is usually of better cloth than one of the same price in the United States, but the eight or ten dollar American suit, made under a system of manufacture as to which the English have much to learn, is of the same grade of cloth as the English and of superior make. American shoes are sold in every city of England; American furniture, much cheaper than English, is on the market. Again, in these respects the British working classes buy sparingly as compared with Americans of the same occupations. They wear one suit at work and on the street for years, with a two-shilling cap instead of a two-dollar derby. Their habitations are noticeably bare of furniture. It is significant that while in England the slot gas meter is adjusted for a penny in America it takes the workingman's quarter, and there is no mechanical difficulty in adjusting it for a shilling or even a sixpence. As to rents, there is as much difference in cost and grade of housing between English cities as between English and American cities, and the differences between American cities seem to baffle general comparisons. Further differences are introduced in this country by its three classes of working men—the American born, the immigrants, and the negroes. On this question, general averages of many local averages are liable to be deceptive, and quotation of particular examples cannot give the inquirer satisfaction. But the overcrowding common in cities of Great Britain—the tens of thousands in Glasgow, Liverpool, and London living a family of three to ten persons in a room, the hundreds of thousands in all the Kingdom living a family in two rooms—is unknown among white Americans. There are cities in Great Britain in which slum life is the fate of the majority of the workers. In the Glasgow gas works meter repair workroom, where 100 men were at work, the trade union speaker for the hands said that more than 90 per cent. of them lived with their families in one room and a kitchen. When the low rent of the British workingman is mentioned it commonly connotes a neighborhood and an environment that to an average American would be unendurable. Moreover, what the tenant gets differs vastly in the two countries. An American's ideas of the requirements of a dwelling place are more exacting than an English workingman's. And when all is said, the actual outlay for a wage-worker's housing in Great Britain, having regard to number of rooms, appointments, house space and yard space, is not at a percentage so much lower as to impress the American who knows the variations existing in his own land. Last summer, Miss Octavia

Hill opened up in an improved area in Southwark, London, several blocks of rows of cottages in which eight hundred families were to be accommodated. The rents for flats in these houses ran from 5s. 6d. to 10s. 6d. per week, or about $7 to $12 a month; five-room cottages were held at $18 a month. A similar scale of housing can be had in Philadelphia at much the same rates. For the better grade of cottages at Cadbury's Bourneville the rents do not seem low to an American acquainted with the average rents of the smaller cities of New England and Pennsylvania.

One item in the outlay of the British workingman, taken in the mass, British statisticians report, exceeds by 50 per cent. that of the American workingman, taken in the mass. It is drink. That plain water is not a table drink is a prevailing national sentiment in Great Britain. The most popular and usually the only meeting centre for the men in British factory towns is the public house. Restaurant meals almost invariably include a drink other than pure water. This habit of the British nation must be taken into account in estimating the cost of living.

The American wageworkers are inspired by hope; the British wageworkers are commonly not.

In traveling from place to place in the United States and mingling among the wageworkers, the observer frequently hears references to achievements in the lives of laboring men formerly neighbors, or once of the very circle present, which convey an impression of a society that, whatever the struggles of the mass, sees constant changes of large numbers of individuals for the better. In Great Britain little of the talk runs this way. America has space, and the workers move about in it continually; it has cheap land, readily transferable, in suburb or country, East or West; it has colleges and universities at which many of the students are earning their way; it has enormous numbers of wageworkers buying their own homes, separately or in association; it has democracy in politics, and numberless openings for a political career, worthy or unworthy. In all these regards, Britain differs greatly as to degree if not wholly as to kind. The British workman travels little, cannot buy a farm or take free a homestead; he rarely gets to college, and he regards a professional or business career as ordinarily beyond his dreams. The confirmed attitude of the British workman toward life is discouragement; the tone of his conversation, the interpretation of his spirit, is despondency. Not yet can this be said of the American workingman.

Poverty in Great Britain has reached the point at which it is affrighting the nation. London alone had 140,000 paupers last year. It has 70,000 to 80,000 "lodgers." The general physical deterioration of Englishmen is shown in the repeated reductions of the army standard of height. The London Daily Standard, July 5 last, said: "The upshot amounts to this, that the poor quarters in all our great cities have become reeking, overcrowded hives of only partially employed, underfed, and rapidly degenerating men and women, from whom fate and their own action, destiny and the con-

ditions of their life seem to have removed all rights, and all power, save the continuance and reproduction of their downward-tending species." The number of emigrants last year from Britain was 270,000, nearly every one driven out by the menace of poverty. In addition to the usual appropriations for the 800,000 paupers of the Kingdom, $440,000 was spent last year under the Unemployed Workmen act, the sum this year being made $1,000,000, while the amount to be given by the local authorities and the charitable for the same purpose was expected to reach possibly $1,000,000 more. Eighty-nine distress committees had been set up last year throughout the country. It is a generally accepted custom among the poor people to allow their parents to go to the workhouse during hard times. The trade union minimum wage for England in general outside London is $5.81 per week. The Italian swarms of laborers, who can compete with the negroes, and who underwork the Russian Jews in New York factories, have never attempted to get a footing in England. A tenth of the present immigration to the United States would precipitate in Great Britain a national disorder.

In their distressing situation many English wageworkers are ready to embrace any economic movement that promises even a small fraction of them relief. Victims of desperate social diseases, they have grasped at desperate social remedies. The trade unions being driven into political action through the Taff Vale decision, many of the working classes in general were stampeded on in among the Socialists. Their present economic tendencies find origin in their life-long heartrending distress, in their pent-up existence, in the opportunities presented by the expiration of franchises, and in the work of social theorists who are the product of political and economic conditions unknown in America, and whose teachings make little headway with the American masses and have been rejected time and again at the conventions of the American Federation of Labor.

LABOR AND POLITICS

By JOHN R. COMMONS

In summarizing the report which Mr. Sullivan and I have made on political and labor conditions in America and Great Britain, it is impossible for me to pick out the sentences here and there favorable to municipal ownership and to discredit the sentences favorable to private ownership. I shall take the report as a whole, and shall try to bring together all of the facts exactly as they are and in their true proportions. In order that my position may be more clearly understood I will say in advance that neither municipal ownership nor private ownership have accomplished the good results in the United States that should be expected of them, and both are far behind what both have accomplished in Great Britain. I attribute this backwardness mainly to the infancy of the movement for municipal ownership in the United States. The American people have never seriously studied in detail the financial, political, administrative and labor conditions necessary to make municipal ownership a success, because they have never had thrown upon them the responsibility and necessity of making it a success. The question has not yet been big enough to attract attention, and all the energies of the people in municipal government have been consumed in fighting the private corporations which have possession. We are in precisely the same position that British municipalities occupied 40 years ago in the gas business and 15 to 30 years ago in the street car and electricity business. And the two most noticeable facts regarding the movement in Great Britain are the steady improvement made in municipal operation after municipal ownership had passed the fighting stage and had become a settled policy, and also the great improvement in private ownership and operation during the same period. In comparing the two countries, I have been impressed by this fact more than anything else, that successful private operation follows successful municipal operation. The private companies in Great Britain have learned to accept and act upon a view of their public obligations which we have found to be utterly foreign and inconceivable to the managers of similar private undertakings in the United States. This is seen most strikingly in the fact that the British companies were willing that our engineers should make a physical valuation of their properties for comparison with their capitalization and their earnings, whereas the American companies would not permit such a valuation. Many of the British companies also for years have been subject to com-

plete publicity of their accounts and examination of their books by public auditors and accountants, thus furnishing information that we were not able to get in America. This kind of information is essential both from the standpoint of the prices paid by consumers and that of the wages paid to employees, because it enables us to know whether prices are as low and wages are as high as the companies can reasonably afford. Another instance of the higher view of their obligations held by British companies is the many precautions they have taken to conciliate their employes and to prevent the necessity of strikes. In every case this higher view has come about because the companies have before them the menace of municipal ownership if they do not live up to their public obligations. They cannot afford to have strikes, because they would at once arouse into action the demand for municipal ownership. They cannot afford to keep their accounts private, because in order to head off municipal ownership they must let the people know just how much profit they are making. The consequence is that many of the vices which we have found in private ownership in the United States and which were formerly found in Great Britain have been largely eliminated in that country. And at the same time the vices and crudities of municipal ownership which we have found in the United States have been largely eliminated in Great Britain through experience and through the accurate comparison which can always be made with private ownership.

With these preliminary observations, it will be seen that in weighing and interpreting the facts, I cannot, as an offset to the summary prepared by my colleague, confine myself simply to the facts that discredit private ownership and exalt municipal ownership, but I must summarize all of the facts. In doing so, my interpretation requires that at least for some time to come, both private ownership and municipal ownership be carried along side by side in the same country; that each municipality have full power and home rule to change from one to the other according to its judgment of which it is that offers the better results in the given case; and that in this way the defects of both municipal and private ownership in the United States may be gradually eliminated and both may be brought to the higher level occupied by both in Great Britain.

MONOPOLIES AND POLITICS.

I take it that the key to the whole question of municipal or private ownership is the question of politics. For politics is simply the question of getting and keeping the right kind of men to manage and operate the municipal undertakings, or to supervise, regulate and bargain with the private undertakings. The kinds of business that we are dealing with are essentially monopolies performing a public service, and are compelled to make use of the streets which are public property. If their owners are private companies they are compelled to get their franchises and all privileges of doing business, and all terms and conditions of service from the municipal authorities. And in carrying out their contract with the

municipality they are dealing continually with municipal officials. Consequently it is absurd to assume that private ownership is non-political. It is just as much a political question to get and keep honest or business-like municipal officials who will drive good bargains with private companies on behalf of the public and then see that the bargains are lived up to, as it is to get similar officials to operate a municipal plant. We do not escape politics by resorting to private ownership—we only get a different kind of practical politics.

Since these businesses are monopolies of public service and must make use of public property, the question of municipal ownership is entirely different from that of other kinds of business. A private business that has no dealings with municipal officials and is regulated by competition, has no place in this investigation except by way of contrast. We have found that this difference between the two kinds of business is not always appreciated by certain classes. These are the socialists and the public utility corporations. The socialists are opposed to private competition in any form and would extend public ownership to all kinds of business. The public utility corporations and their defenders naturally seize upon this position of the socialists to confuse the issues respecting their own kind of business. The public at large is misled for a time until the distinction comes to be one of practical importance. This attitude of the several parties to the controversy was most clearly brought to our attention in Glasgow, where public ownership has been extended to all of the businesses occupying the streets. Following the municipal tramways of 1894, many projects were brought forward for further municipalization, including banking, housing, insurance, tailoring and baking. Councillors were elected favorable to these proposals, and the voters, inspired by the remarkable success of the tramways, were not critical in their inspection of these new enterprises which the council was contemplating. In the midst of this socialistic tide, two anti-municipal ownership associations were organized—the Citizens' Union and the Rate-Payers' Federation. They started an active agitation, and, along with other influences, the tide of municipalization has been checked or stopped. We were led to believe that from these two associations we could secure information that would correct the universal endorsement of municipal ownership found elsewhere in Glasgow, but were surprised to find that both associations endorsed all that had been done in municipalizing tramways, electricity, gas, and water. They only opposed the municipalization of other undertakings competitive in character. No more conclusive endorsement of the success of municipal ownership in Glasgow could have been brought to our attention, but at the same time nothing more conclusive could be offered to show that the general public cannot be permanently deceived by the fallacy of the socialists and the dodge of the franchise corporations in confusing competitive business with monopolistic public-service business. The essential difference is that the public-service business is in politics, whether operated by

a private company or by a municipality, but the competitive business does not depend on politicians for its profits.

At this point I am unhappily compelled to put in a word of personal explanation as to the facts brought out in our investigations. I do this with the greatest reluctance and only because my colleague has seen fit to discredit or disclaim those portions of our report which deal with the political activity of public-service corporations. The personal explanation required is to the effect that I investigated thoroughly, or, as he says, "sifted the back-stairs and dark-room talk down to substantial truth," both of the political activities of municipal undertakings and the political activities of private undertakings; and the entire report as it stands, except New Haven and Philadelphia, was written by myself on the basis of facts which I personally investigated. I have set forth in complete detail the political facts regarding municipal operation, to which he confines his summary, and have also set forth in the same way the political facts regarding private operation. Both are backed by the same thoroughness of investigation, and I am as positive of the facts stated in the one case as in the other.

POLITICAL EMPLOYEES.

This can be tested by the situation of the Wheeling gas works. The secretary of the Wheeling Gas Trustees, quoted by my colleague as testifying to the political rottenness of the municipal gas works, is the same man who testified to the political rottenness of the private gas, electricity and street car companies of that locality. Instead of relying on his statements, I interviewed a large number of officials, politicians, business men, employees and others, and checked up his statements respecting both the gas works and the corporations. This shows that while the gas works are in politics, the public-service corporations are also in politics. The gas employees take part in the primaries of the Republican party and the motormen and conductors of the street car companies are given leave of absence on pay to work in the primaries of both the Republican and Democratic parties. Even the officers of the street railway employees' union take part in this kind of traction politics on behalf of their employees. The councilmen and aldermen nominated and elected in this way control the municipal gas works and they control the franchises and contracts of the private companies. The "City Hall Ring" is just as much a ring of the political tools of the private corporations as it is a ring of municipal politicians. To pick out the politics of the gas works and not to see that it is bound up with the politics of the private corporations would be a perverse and one-sided method of investigation. The report gives not selected facts, but all of the facts in the situation. Indeed, the secretary of the Wheeling Gas Trustees, in his indignation towards the political management of the gas works, referred to by my colleague, was defeated in the Republican primaries by the motormen and conductors of the street car company on leave of absence as political workers.

In cities other than Wheeling the convention system prevails instead of the direct primaries, and consequently it was not found that the wage earners of the private companies took a similar active part in political campaigns. But in Syracuse, Allegheny, Indianapolis and Philadelphia, where municipal employees are named by politicians, it was found also that street car, electric, gas and water companies had employed men on the recommendation of councilmen, mayor or chairman of a political committee. This practice was carried furthest by the street car companies of Syracuse and Allegheny. In Chicago, where a most rigid civil service law is enforced, no evidence of political appointments could be found in the municipal electricity or water departments during recent years, but men were hired on recommendation of aldermen by the private electrical companies at the time when their contracts were before the council for renewal.

There is a distinction which has been found in all of these cases between political appointments in municipal undertakings and political appointments by franchise corporations. The alderman or mayor who secures the appointment of a political supporter on a municipal job exerts himself just as much to retain that man in his job as he did to get the appointment for him. But both he and his supporters take a different view when the appointment is secured with a street railway, gas or electric company. The alderman then says, "I get the job for you, but you must make good; I cannot keep the job for you; the company has the right to discharge you if you don't do your work." It is for this reason that the private company has an advantage over the municipal management under the spoils system, for it can get rid of a political appointee after trying him out and finding him inefficient. This explains also why it is that the employees of a franchise corporation, even though they get their appointments through politicians, are nevertheless found to take an active part in organizing themselves in a trade union, but where they depend on the politicians for retaining their jobs and improving their wages and conditions they do not look to a union for protection. Where the politicians' support stops after appointment, as in a private undertaking, they are more likely to protect themselves by organizing a union. The result is similar in a municipal undertaking when civil service reform releases the employee from depending on a politician. The trade unions in Chicago have no difficulty in organizing the workmen who have been appointed through the Civil Service Commission, but they are not able to get the "hold-overs" who came in through political pull.

Curiously enough, the politician profits more in some respects by the appointments which he secures for his supporters with a franchise company than he does by those on municipal jobs. Since all parties understand that the alderman's influence stops after appointment, there is no ill feeling on the part of his supporter if he is discharged. He and his family and friends continue to be the supporters of the alderman who has done his best for them, and

his discharge at the same time makes room for the alderman to name another man who also with his family and friends become supporters. It is different in municipal employment, where it is expected that the politician who gets the job for his follower will keep it for him. If he is removed from that job he loses confidence in the ability or good faith of the politician. On account of these differences in the attitude of workmen, politicians and managers, the private corporation in politics is more efficient from the standpoint of its stockholders than the municipal undertaking in politics, and at the same time the capable politician can build up his organization just as effectively under one system as under the other. Where civil service rules are enforced, as in the Chicago Electric and Water departments, this political influence is excluded, but there is no way of preventing a private corporation from hiring its employees on the recommendation of a politician.

There are other differences which operate to the advantages of the private corporation. Its employees are more minutely specialized, and a few positions of a permanent, semi-political character are created which are kept distinct from the technical and administrative positions, whereas in the municipal undertaking, without civil service rules, a larger proportion of the positions are likely to be semi-political. The municipal undertaking is compelled to keep a few sub-managers, foremen and inspectors who are familiar with the layout of the plant and distributing system, and such positions have been found to be permanent, while the other positions are subject to political vicissitude. In the private corporations investigated the political positions are found not so much in the operating department as in the legal department and among the directors, presidents, and highest officials. These make the bargains directly, by means of a cash consideration or otherwise, with the political managers. Only where nominations are made by direct primaries, as in Wheeling, has it been found that the rank and file of the employees are retained on account of this political influence.

Under the convention system of nominations the principal activity of private corporations was found to be that of contributions to the expenses of campaign committees and candidates. It is difficult to see that it is necessarily dishonorable or corrupt for any citizen to contribute according to his ability toward the expenses of his political party in conducting a campaign. The education of the voters respecting the issues is of the greatest importance and requires corresponding expenditures. But for some reason these contributions are looked upon as strictly confidential, and it was only through the accident of my personal acquaintance with certain participants in Syracuse and Indianapolis that any information on the point was given to me. This shows a contribution of $2,000 in Syracuse by two directors of the gas company to the Democratic campaign committee, in a municipal election. It shows contributions at Indianapolis by the water company in the municipal campaign of 1903 of $300, and in 1905 of $1,500 to the Democratic committee, and in 1905 of $5,000 to the Repub-

lican committee. In 1905 the street car company paid $10,000 to the Republican committee, and $2,000 to the Democratic committee, and the gas company paid $17,000 to the Republican committee. The Republican administration, elected in 1905, has to deal with important franchises and contracts renewable during its term. Professor Gray's investigations of the New Haven water company show that the president of the common council which granted a perpetual franchise to the company was one of the company's own employees and that the company expended $20,457.44 to get this franchise through the council and the legislature, in addition to the fees of $1,498.89 paid to the regular counsel for drawing up the contract.

EFFICIENCY OF MUNICIPAL OPERATION.

Whatever weakens or corrupts city government in its admitted duties of protecting the health, property, life and morals of its citizens, also weakens or corrupts it in operating public utilities or in regulating the private operation of those utilities. We cannot separate the question of municipal or private operation from the question of honest and efficient city government in every other department. The municipal corporation is a unit, and the supply of either water, gas, electricity or transportation is only a single department of its work, and is good or bad to the same extent that the other departments of police, fire, health, parks and taxes are good or bad. When we investigate the politics and labor of these four public utilities we are investigating the whole question of municipal government. If the conditions are such that the city does not operate or regulate these utilities satisfactorily, we find that it does not do anything else satisfactorily. This fact is abundantly demonstrated when we take up one by one the several factors that go to make up the total political life of a city.

First is the suffrage. In all of the Northern cities of the United States the suffrage is on the universal manhood basis. In the Southern cities it is restricted by education or poll-tax requirements, and in British cities by tenant, lodger and household limitations. These restrictions bear most heavily on the wage-earning classes, amounting to the exclusion of one-fourth to two-fifths of the wage-earners. But the classes excluded are the casual and irregular laborers, the pauperized and indifferent workers, the hoodlum and hooligan elements. These are mainly the unorganized laborers, so that in England the trade unions have the field to themselves more than they have in the United States for entering upon a political movement. They are not compelled to make alliances with political bosses who know how to get these unorganized voters. In two Northern cities, Indianapolis and Syracuse, definite information was obtained of bribery of the voters. In Indianapolis the bribable voters are largely the colored element of the town, and in Syracuse the hoodlum, immigrant and colored element of the downtown precincts. Among these voters a large part of the campaign contributions is distributed.

Next to the suffrage are the qualifications of the councillors, aldermen and city officials. In the British cities only the councillors are elected, one each year, holding three years for each ward. The councillors elect the aldermen and the city officials. Most important of all, the councillors and aldermen are not required to live in the wards they represent, and many of them live in the suburbs. One-half to four-fifths of the councillors and aldermen live outside the wards they represent, and the proportion is strikingly larger in the working-class wards which elect two-thirds to nine-tenths of their councillors from outside. Many inquiries were made as to the reasons, on the part of voters, for this indifference as to the place of residence of their candidates, and the explanation that seems adequate is the absence of campaign and corruption funds and the inability of councillors to find jobs for their constituents. The councillor in Glasgow who is most active in pressing for jobs in the municipal service lives in the ward which he represents, among constituents in need of employment. Furthermore, councillors and aldermen are unsalaried. This freedom of choice makes it possible to elect both the leading business men and the leading labor men to govern the city. Not only do we find eminent bankers, financiers and employers of labor in the councils, but we find the secretaries and officials of trade unions, most of them living outside the wards they represent. The absence of such leaders and truly representative men from American city councils is the most discouraging fact brought to our attention. We have not found any of the leading business men corresponding to those in British cities. The largest delegation of wage-earners which we found was in the city of Wheeling, where they number fourteen, but not one of them was an official or representative of a trade-union, although the unions are stronger in Wheeling than in the other places visited. There the wage-earning councillors were largely the employees of corporations whose owners were interested in the public utility corporations. Their campaign expenses were paid from those sources, and their successful qualities were those of a good "mixer" with the voters and obedience to their employers in casting their votes as councilmen. In other cities not provided with the direct primary system of nominations there were practically no wage-earners in the council.

In American cities the form of organization has been found to be most complicated. Authority and responsibility are scattered here and there in a mayor, a commission, a superintendent, a council, a committee of the council, or even two committees, sometimes a joint committee of two branches of the council, a civil service commission, and so on. The finances and accounts of municipal undertakings are mixed with those of other departments. Scarcely any system that we have investigated would for a moment be recognized as satisfactory for an effective business management. The voters are unable to tell who is responsible or what exactly are the financial results. The one pre-eminent advantage of private operation is centralized control by one man, subject to a board of

directors. This is also the form of organization of the British cities, where a committee of the council takes the place of the board of directors, and the manager, selected by the committee, holds his position not for a fixed term but permanently, or until removed. The American system most nearly corresponding is the commission system of South Norwalk and Detroit, which permits the selection of men from any part of the city and retains a number of them when others drop out.

The foregoing statements refer only to the legal or formal organization of British and American cities. The real political influences behind this formal organization are found in the conflicting interests of the voters who elect or control the city officials. In both countries the interests that are most important in deciding the results are those of the saloon-keepers, real estate owners, political parties, trade unions, municipal employees, business classes, contractors and franchise corporations.

In both countries the saloons, known in England as the "public house," or "pub," are regulated by the municipal council. This compels them in self protection to take a part in politics. In some places, like Glasgow, their candidates make a pretense of standing for workingmen, and they appeal to the labor vote in support of labor measures in the council. In other places like Liverpool the large brewery interests enter the field as capitalists, and elect their partners to the council. In American cities the saloon interest is an important wheel of the political machine. In any case their candidates are elected, not for the sake of efficient government, but really in order to weaken the government that endeavors to regulate their private business.

Much less evidence was found of real estate dealers and speculators in British cities than in American cities. Owing perhaps to the system of landed property and the jealousy of the landed interest, real estate speculation is very quiet and subdued in British cities. The councils, outside London, are almost exclusively of the commercial, manufacturing, professional and labor classes. The purchase and sale of sites either by a council or by a company, and the selection of routes, are so jealously controlled by the landed interest intrenched in the House of Lords, that land speculation in connection with public utilities does not greatly influence the local councils.

In all of the cities visited in Great Britain, except Glasgow and London, it was found that national political parties managed the municipal elections. The exception in Glasgow is mainly owing to the fact that there the Liberal party is so overwhelming that the Tories have no chance. Even the committees that manage the municipal undertakings are selected so that the dominant party of the council has majorities. In two places, however, Leicester and Birmingham, an eminent financier of the opposite party is elected to the head of the finance committee. Party politics in itself is not a barrier to successful municipal operation.

The part taken by the working classes in the election of councillors in England is divided into two stages. The few labor members elected ten to twenty years ago came in as members of the Liberal party and they retain that allegiance. They are first Liberals and secondarily trade unionists. The second stage is that of the Labor party of the past five years, in which the trade unions have joined with one wing of the socialists. The object of the Labor party has been that of getting legislation to protect the funds of trade unions from attachment by the courts. It has, however, organized local branches for municipal elections. Much the largest number of candidates put up by the Labor party are the salaried officials of the unions, who, if elected, retain their union position. They are not usually "organizers" or "agitators," for the British unions do not have such salaried positions, but they are the official secretaries who are at the same time the experienced negotiators with employers. A much smaller class of so-called "labor councillors" are the socialists, who are generally small merchants, employers or professional men, with a program more radical than that of the trade-unionists. Finally, there were found a half dozen political adventurers of the "fakir" type, not nominated by the Labor party, but taken up by the Liberals, Tories or public-house interests to draw off the vote of the Labor party. In general, while some criticism was heard from aged councillors or from old-line trade-union Liberals, to the effect that the new labor movement was deteriorating the character of the councils, yet the criticism was confined to the lack of business and financial capacity, to the inability to take "broad" views of municipal business, and to the efforts to find municipal work for applicants. With the exception of the half dozen adventurers, no criticism is made of their integrity or earnestness and sincerity of purpose in urging the cause they advocate; while in the case of the trade-union officials there was a general agreement on the part of all classes that they brought a kind of intelligence and a point of view that was needed in the council's deliberations as a large employer of labor.

ORGANIZATIONS OF MUNICIPAL EMPLOYEES.

The increase in municipal ownership in Great Britain has, of course, brought an increase in the number of municipal employees, and this has caused apprehension in certain quarters. Generally the chief officers of the municipal enterprises take the ground that they and other employees should not vote in municipal elections, and they openly set that example to their subordinates. Some of them go even so far as to advocate the disfranchisement of municipal employees in municipal elections. This has also been advocated by some of the councillors. However, such a proposition is no longer seriously considered. If the vote of municipal employees is a menace the remedy must be looked for in directions other than disfranchisement. It goes without proof that such a remedy is needed, for municipal employees sooner or later cast their votes for candidates who promise or have secured a betterment of their con-

dition, regardless of its effect on the enterprise as a whole. Omitting disfranchisement, there are two directions in which such a remedy can be found, first a limit to be set beyond which municipalization shall not go, and second, the attitude of the public and especially of the workmen in private employment.

Although there are doctrinaire and socialistic elements that set no limit to public ownership, the overwhelming sentiment of those now in control of the municipal councils places a limit at the point already reached by cities like Glasgow, Manchester, and Leicester. With this practical agreement there is no prospect that the number of municipal employees will be materially increased beyond the proportion reached in Glasgow, where their voting strength is possibly one-sixteenth of the total. The total number employed by the London County Council and the London Borough Councils is about one-fourteenth of the registered voters.

The natural tendency of municipal employees to better their own condition by use of their political strength is seen in the growth of the Municipal Employees' Association. This is a spurious form of trade unionism which has sprung up with the growth of municipalization, and nothing of its kind has been found among American unions. It has gained affiliation with other unions in the Trades Union Congress and in local Trades Councils. Its platform is simple enough: to prohibit strikes, to oppose councillors at the polls if they stand in the way of granting its demands, and to call on other unions for help in the elections. Its demands are in excess of anything that other unions have been able to secure from private employers or even from municipal corporations. It invites into membership all employees of municipalities, and since they are nearly all eligible to other unions, evidently the aim of this organization is to separate a privileged class of workmen, and to do this through the political power of those whom they abandon. It weakens other unions while building on their support. With even a minimum of intelligence in the other unions such a parasitic union would be repudiated. Such has been the fate of the Municipal Employees' Association. As long as its membership was small the consequences of its policy were not observed, and its demands received the uncritical assent of others in the general approval of all efforts to raise wages. But with its rapid growth during the past two years, the unions of unskilled workmen, who suffered first from its competition for members, brought their protest to the Trades Union Congress in 1906. and that body, after careful deliberation, repudiated the Municipal Employees' Association and all similar organizations of public employees by the practically unanimous vote of 1,196.000 to 42.000. It is thus promptly settled, before this organization had reached 15,000 members throughout Great Britain, that the trade union world is clearly opposed, both in sentiment and self-interest, to the creation of a privileged class of municipal employees. As far as the regular trade unions are concerned the principle of trade-union wages, rising and falling in municipal employment the same as in private

employment, is accepted in its full significance. Without the support of the regular unions the strength of the Municipal Employees' Association has disappeared. It was a temporary phase of the rapid increase of municipal ownership.

Our investigations have shown that the proper method of dealing with employees is the most difficult and critical problem of municipal ownership. The appointment, promotion and dismissal of employees and the wages to be paid offer peculiar opportunities for political and personal influence inconsistent with efficiency. Civil service reform, so-called, has been found in its highest perfection in the city of Chicago, but it is evident by comparison with a less perfect device in Syracuse that its integrity depends on the political influences that control the mayor and the heads of departments. If the head of the department is independent of politics, as shown in Cleveland, Detroit and South Norwalk, the civil service commission is not needed. The Chicago system is a temporary bulwark built around the departments until such time as the chief officer himself can also be protected from political selection. This is the case in British cities where the idea of a civil service commission is unknown. But even there, especially in the Sheffield tramways, appointments have been made on the recommendation of councillors. The experience of Glasgow is instructive. Fifteen years ago the practice of hiring employees on the recommendation of councillors was universal in all departments. But with the growth of municipal ownership it has almost disappeared. This is partly because several thorough investigations of alleged favoritism have been made by the council; partly because public spirited business men have exposed the evil, have made it clear to the voters and have been elected to the council on the issue of driving out favoritism; and partly because the adoption of the minimum wage policy of the labor members has stopped the practice of councillors' unloading and pensioning their old employees on the municipal pay-roll. The only remnant of the practice discovered after a thorough investigation in Glasgow was in the unskilled work of the tramways, and this came about through the effort of that department during the industrial depression of 1905-6 to aid the city government in finding work for the unemployed. The pressure for employment during the depression was enormous and all managers were besieged by hundreds of applicants. A card of introduction from a councillor secures at least the privilege of filling out an application blank, and this amounts to a limited preference over those who do not have such cards, but the managers follow up the application by a thorough examination before making appointments. In other places all charges of favoritism were carefully investigated and they were found to be baseless, except in the case of motormen and conductors at Sheffield. These are selected on the recommendation of councillors. The Manchester Tramway Committee, at the beginning of its organization, recognizing the possible evil, adopted a rule instructing their manager not only not to pay attention to letters from councillors but to give preference to applicants who have no such recommendations.

Our investigations have shown that the strongest safeguard for a manager against the pressure of outside recommendations is the recognition of organized labor within his department. Wherever we have found a class of employees organized and dealt with as such through their representatives we have found those positions exempt from politics. This follows from the nature of labor organization which cannot survive if individuals are given preference on political, religious, personal or any other grounds than the character of the work they do. Even in the politically honeycombed municipal undertaking of Allegheny, the union of electrical workers stopped the practice of paying assessments by its members for political campaigns. The success of the civil service system of Chicago is owing more than anything else to the fact that organized labor has one of the three members on each examining board. The manager of the Manchester Tramways ascribes his freedom from interference by individual councillors to his recognition of the union that holds 90 per cent. of his motormen and conductors.

PRIVATE COMPANIES AND MUNICIPAL COUNCILS.

The foregoing is a review of several interests which have been discovered as tending to weaken the efficiency and integrity of municipalities in the operation or regulation of monopolies, together with the factors that tend to correct these evil tendencies. In inquiring into the part played by all of them, including saloonkeepers, real estate speculators, party politicians, and municipal employees, the most impressive fact in Great Britain is the absence of any political "machine" which could bring them together and line them up under a centralized control. Whatever corrupting or incapacitating tendencies there may be in these several interests that come into conflict with good administration, each works by itself and there is no permanent interest or class of manipulators which thrives by marshaling them together in a perpetual onslaught and undermining of the city government. Public spirited and independent citizens are not compelled to enter into bargains nor to make promises to a political organization, which would disgust them with a position on the Town Council. This absence of a powerful machine is mainly due to the fact that there are no great financial bargains at stake, such as municipal contracts or franchises, whose owners have a direct interest in breaking down city government. None of the menacing factors above mentioned is large enough, and all of them combined cannot gain enough, to warrant them in making large contributions to an expensive organization for the control of elections and appointments. The brewery interest is practically the only interest of financial importance whose profits can be menaced by acts of the Council, but the menace to it is based on moral and not financial grounds. In resisting this menace it does not directly attack the business integrity of the Council, but, more important, there is no opportunity for it to make an alliance with contractors and franchise speculators who could increase their profits and make sharper bargains

with the city if the councillors were weak or corrupt, or under the control of a machine which they must support. The absence of powerful financial opponents of good government leaves the way open for business men to enter the councils and to attack abuses or defend the interests of the city without risking their private business or antagonizing their social circle. The eminent bankers, financiers, and merchants who serve the cities as aldermen on the finance committees are free to do so because neither they nor their clients or business associates are interested in stocks which might be depreciated if they helped the city to drive a good bargain. These men are often the directors in large manufacturing, railway and other private companies. Councillors and aldermen on the gas, water, electricity and tramways committees are even stockholders and directors in private gas and water companies of other towns. It would be impossible for such men to act conscientiously on the great board of municipal directors, and to give the town the same kind of service as they give to their private companies, if they or their business associates were interested in companies which had business relations with the Council. Neither could the medium and smaller business men and employers afford to accept positions on the councils and take the independent stand they do, if the bankers and large business men on whom they depend for credits and sales were interested in the stocks of franchise companies. With these great antagonistic interests out of the way, the business men of the town find, not only that their private business is not menaced, but that the conditions of all private business are greatly improved, if they lend their abilities to the improvement of municipal business. The time which they take from their private affairs is often not even a business sacrifice. The honor and distinction of public service on the council is really an advertising asset in their private business. It would be a liability if they were called upon to antagonize large financial interests.

I do not hold that the contrast in American cities gives evidence that the private corporations which we have investigated have taken the initiative in corrupting and weakening the municipal councils. The initiative has just as often come from corrupt officials who "hold up" the corporations. The real question is not, Who is to blame? or, Is it blackmail or is it bribery? but the real question is, What is the situation that compels officials, campaign committees and corporations to resort to blackmail and bribery? Plainly by comparison of American and British cities the answer is found in the enormous profits at stake on municipal elections.

It is the absence of a political machine and its financial contributions that also makes possible the election in British cities of remarkable groups of Labor councillors. With but few exceptions the labor members are representative of the best elements of the trade unions. Although they lack the financial experience of business men they contribute a valuable knowledge of labor conditions on which successful management of municipal undertakings depends. Men of their integrity and earnestness have the opportunity

to come forward because the trade unions are not undermined nor their leaders bribed by the paid agents of a political machine. And the financial interests that would profit by the election of weak or dishonest labor candidates are not powerful enough to subsidize the astute agents needed by the machine for the purpose.

A contrast with this situation appears in two of the places visited where private companies operate public utilities. The municipal council of Newcastle-on-Tyne is decidedly inferior in quality and ability to others, and two of the leading financiers on the council declared that their only reason for remaining in the position is the election which the council gives them as corporation representatives on the Tyne Improvement Commission. The presence of private gas, electricity and water companies, with their representatives in the council, prevents the leading business men from interesting themselves in the success of the municipal government, while an equivocal class of labor agitators takes advantage of the situation to get elected to the council. Sheffield, also, with its influential gas company, is the only town visited where the employees in the tramway and street departments are appointed through the influence of councillors. In that town there is a peculiar inducement for the eminent business men in charge of the gas company to look with approval on the election of inferior councillors, because the council elects three of its members as directors of the company. The strength of the company is seen in the incompetency of these municipal directors, who are kept in ignorance of essential details in its affairs. With councillors of this inferior type and with the indifference of business men to the management of municipal affairs, the result is seen in the absence of any protest against practices which are undermining the municipal undertakings.

Certain effects of the municipal ownership movement in Great Britain on the private companies are evident. The Sheffield Company, under the far-seeing management of Sir Frederick Mappin, has directed its policy for many years with the distinct purpose of meeting the arguments for municipal ownership. To avoid agitation it has refrained from going to Parliament for permission to increase its capital stock. Consequently it has distributed its large surplus profits in the form of reduced prices for gas and betterments to its plant. Most instructive of all is the attitude of the companies toward their employees. With the sentiment of municipal ownership ready to explode, the companies cannot afford to risk a strike. The Newcastle gas company has met this situation by a willing recognition of the gas workers' union and by a resort to arbitration through which wages have been materially raised. The South Metropolitan Company has developed its copartnership scheme with astonishing shrewdness and careful attention to details, so that every disaffected workman is silent or dismissed. The Sheffield Company, although its president had openly attacked and wrecked trade unions in his private business, contented itself with gradually undermining the gas workers' union, through the payment of wages and bonuses superior to those paid by other private employers of the

district, and even in the case of unskilled labor, superior to those paid by the corporation of Sheffield.

TRADE UNIONS AND WAGES.

The influence of wage-earners through their unions upon the conditions of municipal employment in the United States has been complicated through the presence and activity of practical politicians. In the municipal enterprises investigated, except South Norwalk and Richmond, the eight-hour day has been established for the past ten or fifteen years for all employees, whereas, in the private companies the hours are longer or have more recently been reduced for a portion, but not all, of their employees in the more skilled branches of work. This advantage in municipal undertakings has been brought about, not by a definite labor party, but by the influence of wage-earners as voters upon the municipal officials.

A curious contrast, however, presents itself in the wages paid by contractors on municipal work. While the larger cities in their own employment reduced the hours several years before similar reductions were made by British municipalities, yet, unlike the British municipalities, provison was not made requring contractors on muncipal works to observe the hours and wages paid by the municipalities themselves. It has only been within the past five or six years that a definite movement was undertaken by the wage-earning element to extend these provisions to contractors, and this, on account of adverse decisions of the courts, led to the adoption in New York of a constitutional amendment in 1905 stipulating that the prevailing rate of wages should be paid by contractors on the work of the State or its sub-divisions. This clause has recently been adopted by the city of Chicago. The hand of the politician is seen in the omission of the contractors from the requirement respecting wages and hours, since by this device he was able to win both the wage-earners and the contractors to his support. But with the more extensive organization of wage-earners and their independence of the politicians, the contractors are placed on the same basis as the municipality.

In only one case investigated in the United States is there a formal trade agreement between the union and a municipal department, namely, that of the electricity department of Chicago, but since permanent appointments in that and other departments of Chicago are controlled by the Civil Service Commission, the effect of this agreement is to control only the temporary or sixty-day appointments. The unions, however, are recognized by the Civil Service Commission to the extent that an officer of the union concerned is appointed as one of the three members of the examining board which passes upon applicants for municipal positions. The other two members are employers or technical experts selected by the commission outside the municipal service. The consequence of this arrangement is that the unions are satisfied that the Civil Service law is honestly administered, and at the same time, the non-union workmen are protected against discrimination. In Great

Britain there are two undertakings, Birmingham gas and Manchester tramways, which have trade agreements with the unions, and in all other places the same result is reached by the provision requiring the payment of trade-union rates of wages.

The municipal undertakings in both countries are necessarily "open shop," in the sense that employment is open both to union and non-union men. In the case of the more skilled trades this usually results in the employment of union men, depending partly on the attitude of the manager. This attitude is favorable to the unions in all of the British municipalities except Liverpool and is favorable in the American cities of Cleveland, Detroit and Chicago. In these places the managers consult the union officers in arranging wages, hours, and conditions of work. The three American places mentioned are those where the political machine, supported by the contractors and franchise corporations, has been eliminated from the control of the city government by a popular revolt against the corporations. But in Allegheny. Syracuse, Wheeling and Indianapolis, where a combination of politicians and franchise corporations is in control of the municipal government, the attitude is distinctly hostile to the unions, and appointments and promotions are made with reference to the political adherence of the employees. The exception to this statement is found in the Allegheny electric undertaking to the extent that the Electrical Workers' Union has organized the linemen. In this case appointments are not made on political grounds and the linemen do not pay the assessments required of other employees. Of the private companies investigated in Great Britain, all of them except one were hostile to union labor. The exception is the Newcastle gas, which has had open-shop agreements with a gas workers' union during seventeen years. In the United States all of the private companies are hostile to union labor. Most of the companies in both countries protested that they were not hostile, while only one asserted positively that it was, but the acts and policies of all, as shown by our investigations, demonstrate their hostility. The situation respecting each branch of organized labor in both classes of undertakings is briefly as follows:

The Electrical Workers' Union throughout the United States numbers about 21,000 members. Its principal strength is found among the Wiremen, who are associated with other skilled trades in the construction of buildings, among shop men in manufacturing establishments, and among linemen employed by telephone companies. The organization has a much smaller proportion of the employees of electric light and street railway companies. It has no organization among private companies coming under our investigation. It has an organization in the Detroit Electric Company, which we used for comparison with the Detroit municipal undertaking. The presence of the municipal enterprise, with its eight-hour day and its recognition of the Electrical Workers' Union during the past eight years, has served as a standard by which this private company has endeavored to guide itself and to put itself in as favorable position before the public as the municipal undertaking. The

company indeed has created a semi-pension position for the president of the Electrical Workers' local union, giving him leave of absence to use his influence among aldermen and the working people of the town at times when the council has before it an ordinance for the regulation or reduction of rates or services. The situation is different in Chicago, where a local union of the same organization has been defeated in strikes by the electricity companies and where the union is able to maintain its scale of wages and secure employment with those companies only in the branches of work connected with the building trades where it has the support of other trade unions in the town. Even in that exceptional circumstance, the union has been compelled to allow its men to work at 15 cents a day less than the scale paid by the municipality and by other fair employers. The organization is not represented in the municipal enterprise of South Norwalk, although the local union has officially declared that undertaking to be a "fair shop" and permits its members to work alongside municipal employees who are not members.

The situation of the Electrical Workers' Union in Great Britain is somewhat similar to that of the corresponding organization in this country. It, however, has been handicapped by the fact that the powerful association of Amalgamated Engineers (machinists) has always claimed electrical workers as coming under its jurisdiction. Four other unions also claim jurisdiction over the electrical workers. The Amalgamated Engineers are interested more in the organization of fitters, turners and blacksmiths than in the organization of electrical workers, pattern makers and other smaller elements claimed by them. It has only been in the past year that the Amalgamated Engineers recognized the Electrical Trade Union and consented to their admission on equal terms in the Engineering and Shipbuilding Federation. One consequence of the conflict with other unions is that the Electrical Workers' Union in that country has not been aggressive and has limited itself practically to municipal employees and the employees of contractors on municipal work. It has only recently begun organizing the shop men in manufacturing establishments, but has no men with any of the private companies investigated.

The stationary firemen's organization includes about 13,000 members throughout the United States, of whom 4,000 are in New York City. This organization is not strongly represented in any of the places investigated except Chicago and Cleveland, where it includes all of the firemen in the municipal electric and water works. The union was defeated in a strike by the Commonwealth and Edison companies of Chicago and has no representation now in their employment. It has members in the municipal undertaking of Detroit, but not in Syracuse, Richmond or Wheeling, nor in any of the private undertakings. This union claims jurisdiction over stokers in gas works, but none of its members were found either in the municipal or the private gas undertakings.

The national union of stationary engineers, with its 17,500 members, has members in the municipal undertakings of Cleveland,

Detroit, Allegheny, Wheeling, and Chicago, but not in Richmond nor in any of the private undertakings.

The firemen and engineers of Great Britain are claimed by a half dozen organizations, all of them weak and conflicting and none of them represented in any of the establishments visited. Where the gas workers' union is recognized it includes the firemen.

There is one organization, that of street railway employees, for which comparisons between private and public employment cannot be made in the United States, since there are no municipal undertakings of that character. The British organization, which nominally includes teamsters and drivers as well as motormen and conductors, is practically confined to the latter, and for the last six years has increased its membership solely among motormen and conductors. Its membership consists of 9,500 in municipal employment and 1,500 in private employment, a ratio of one-half of the motormen and conductors employed by all municipalities and one-third of those employed by all companies. The three private companies investigated, namely London, Norwalk and Dublin, have taken a decided stand against the organization, have discharged those of its employees who became members and have required bonds or deposits which are forfeited if the men quit without giving one or two weeks' notice. Two of the municipalities, London and Manchester, are organized in this association to the extent of nine-tenths of their employees, while in two other establishments investigated, Liverpool and Glasgow, the municipalities have established benefit associations and in Liverpool the union was disrupted by embezzlement on the part of its officers. The wages are so much in advance of what these employees received from the former private companies that the union does not appear to offer them any particular advantages if they should join it. In the United States, where the street railway employees are all in the service of private companies, the membership of the union paying dues throughout the country was 36,000 in 1902 out of a total number of employees eligible to membership in that year of 134,000. This was 27 per cent. of the employees of those companies, or something less than the proportion organized in the private companies of Great Britain and about half of the proportion which the British union has of the municipal employees.

In none of the American enterprises investigated were the common laborers organized. In the municipal undertakings they are paid higher wages and given shorter hours than in the case of private employees of the same locality. They are also in all cases citizens of the United States, and residents of the locality. The common labor of the private companies, except in Indianapolis and the Southern cities, where they are colored, is composed largely of immigrants and no attention is paid as to whether they have secured citizenship papers or not.

MINIMUM WAGES.

In the matter of wages and hours the principal effect of municipal ownership is seen in the unskilled and unorganized labor in both

countries, in that of street railway employees in Great Britain and in that of gas workers and electric workers in the United States.

The policy of all of the British municipalities is to place the minimum wages of common labor at the level paid by the best private employers for similar work. This is about 15 per cent. to 40 per cent. higher than other private wages for the same class of labor in the same locality. The greatest difference, that of Leicester, was the result of arbitration, brought about through the organization of common labor in that town. In this case those private employers who recognized the union paid the same wages as the municipality. In one locality, Sheffield, the minimum wage paid by the gas company is higher than the minimum paid by the municipality and other private employers, and the gas company at Newcastle pays its organized common labor the same minimum as the municipality, but all of the electric and tramway companies pay less for common labor doing the same kind of work than the municipalities in which they are located.

In the United States the minimum paid for common labor by the private companies is, in all cases, except Atlanta, lower than that of the municipality, and the minimum paid for common labor by municipal undertakings is higher than that of private companies of the same locality. The correspondence runs as follows: Syracuse, municipal $1.50 for eight hours, private $1.50 for ten hours; Detroit, municipal $1.75 for eight hours, private $1.80 for nine hours; Allegheny, municipal $2.75 for eight hours, private $1.75 for ten hours; Wheeling, municipal $1.85 for eight and nine hours, private $1.85 for ten hours; Cleveland, municipal $1.76 for eight hours, private $1.75 for ten hours; Indianapolis, municipal $1.60 for eight hours, private, $1.50 for ten hours; Chicago, municipal, $2.00 for eight hours, private $1.75 for ten hours; New Haven, municipal $1.50 for eight hours; private $1.50 for nine hours; Richmond, municipal $2.00 for nine hours, private $1.20 for nine hours; Atlanta, municipal and private $1.00 for ten hours.

These are the minimum rates and not the average rates nor the highest rates paid for unskilled and usually unorganized labor. In this respect the municipalities, both in Great Britain and the United States, have adopted the trade-union principle of the minimum wage for that class of labor which ordinarily has no union, and all of the familiar arguments for and against the theory of the minimum wage as applied to trade unions can be brought forward as applied to the municipalities. Against the minimum wage theory is the criticism that it shuts out from employment the old men who are not worth the minimum wage, and my colleague, though speaking ostensibly for the trade unions, nevertheless by condemning this result in municipal employment, condemns the fundamental principle of trade-unionism. The private companies investigated, which pay less than the minimum, of course, justify it on the ground that the Italians, negroes, and others employed are not worth the minimum, but the trade unionist usually tells them that by paying the minimum they would attract better workmen. So far as our in-

vestigations have gone, they show that in municipal employment this has been the case. Since the adoption of the minimum wage policy, enforced sometimes by civil service rules, the quality, character, physique, and efficiency of the common labor employed by municipalities has been greatly improved, and municipal employment has ceased to be looked upon as an old-age pension for laborers worn out in private employment. This is a hardship to individuals to the same extent that trade-unionism is a hardship to individuals. But from the standpoint of the municipality it is a gain, because more competent laborers are employed, and municipal employment is clearly distinguished from municipal charity. The aged and inefficient laborers, discharged from private employment, and unable to secure municipal employment, must, of course, be supported from the public treasury, and it is a significant fact that the movement for old-age pensions as a substitute for the poorhouse in Great Britain has been strengthened by the minimum wage policy of the past ten years which has relieved municipal employment of its poorhouse features.

In all of the occupations where organized labor was found, the policy of all of the municipalities investigated, except South Norwalk, is that of paying the trade-union rate. This is also, of course, a minimum rate and the conditions are the same as those governing private employers of the locality who recognize the union. A few cases of individuals were found where the city was paying individuals less than the unions, but these were cases in which the union had granted a permit to work below the scale on account of old age, or were cases over which a dispute as to the character of the work was in process of adjustment, or where, as in Chicago, wages in private employment had been advanced after the municipal budget had been voted and the latter could not under the law be changed until the next fiscal year. We have not found any instance, except that of the Municipal Employees' Association in Great Britain, above mentioned, where the unions have demanded higher minimum wages of the municipality than those paid by union employers. Individuals, both in municipal and private undertakings, get higher wages than the union minimum.

Outside the ranks of unskilled labor in Great Britain the principal difference between wages in municipal and private undertakings is found in the case of the motormen and conductors on tramways. This has been brought about by a reduction in the hours of labor in municipal employment, so that in two municipal undertakings, Glasgow and Manchester, the hours have been reduced to 54 per week, and in two others, the Liverpool and London County Council, to 60 per week, while in the three private undertakings the hours are 70 per week. Since the wages have not been decreased the result is seen in the rate of pay per hour. Taking the London County Council Tramways and the London United Tramways, where comparisons can fairly be made, since both are in the same town, the wages for motormen are 4.2 per cent., and for conductors 30 per cent. higher on the municipal than on the private system.

Outside London, considering the local levels of wages, the municipal undertakings pay higher wages than the private undertakings. This difference is not owing to the change from horse to electrical traction, since the wages on the municipal undertakings were advanced when the municipality secured possession, which in the case of Glasgow was six years before electrical traction was adopted. The private companies, although paying less than the municipalities, have also advanced their rates of pay with the introduction of electrical traction. The same is true of the traction companies in the United States, although our investigations have not included a survey of these companies, and we are unable to make a statistical comparison.*

In the case of gas workers employed by the municipalities and private companies in Great Britain it has been found that, with the exception of the South Metropolitan Company, there is not much difference between the wages paid in the two classes of undertakings. The differences observed in this occupation grow out of the amount

*The practice of my colleague in going outside the matters actually investigated by us and introducing criticisms that we have not investigated may be judged by his quotation from a socialist critic of the Glasgow tramways—a class of critics whom in general he loses no opportunity to discredit. Since these criticisms have been introduced after our report was handed in, I have had no opportunity of "running them down," as was thoroughly done in other cases, and can only quote from a reply to my inquiries received from the General Manager under date of May 20, 1907. He says: "In regard to the first point, we never ask an applicant for a situation for a written 'character'; we simply wish to know from him what situations he has been in during the past five years, and the names of his employers during that period. On leaving the service he is informed that any communications regarding him will be promptly attended to."

"The question of conductors paying the full value for lost tickets is fully dealt with in the report sent you." The report referred to is one made under date of February 20, 1907, by the General Manager to the Tramways Committee, in answering a petition of the Municipal Employees' Association, and includes the following paragraph: "The conductors desire that when any of the tickets entrusted to them go astray, they should only be held responsible for the cost of printing the lost tickets and not for their face value. I cannot find that any conductor during the past year has been charged the face value of lost tickets who has come forward with an explanation. We must, however, be very strict in the matter of lost tickets because these tickets are worth their face value both to the department and to the conductors. They must therefore be regarded practically as cash. Each case is considered on its merits, and I am perfectly satisfied that the conductors have nothing to complain of in the way they are treated in regard to lost tickets."

The General Manager continues: "I never heard it suggested that in our service men are supposed to report each other for neglect of duty."

"In regard to the wearing of uniform, we would not allow a man to take up duty unless he were properly dressed."

"The punching of a ticket in the wrong place is a very serious offence."

Respecting the statement that 1,085 men on the Glasgow tramways "have less than three years' standing as employees," the essential fact is omitted that nearly one-half of these are filling new positions created during the past three years by extension of the system.

of work required of the stokers. On account of the severity of the work it is the practice both of the private companies and the municipal undertakings in the United States to require the stokers to work actually only one-half of the number of hours for which they are paid, the other half being available for recreation. This is true also in three of the municipal undertakings in Great Britain, while in the fourth, Glasgow, the stokers work five hours out of the eight instead of four. In this respect Glasgow is on the same basis with the most favorable of the private companies, Newcastle, where on account of the presence of a strong labor organization, the stokers also are on the basis of five hours' work for eight hours' pay. In the other two private companies, which have succeeded in destroying the labor organizations that formerly existed, the amount of work required of the men has been increased to a greater degree than the increase of wages. So severe was this hardship on the employees of the South Metropolitan Company that in two of the stations they voted to accept the proposition of the company to return to the twelve-hour day and to forego the advantages of the eight-hour day, which they had secured through their union in 1889. By increasing slightly the total amount of work in the twelve-hour shift they increased their total daily wages, but the cost of labor to the company is the same on the twelve-hour basis as it is in the other stations on the eight-hour basis. Measuring their wages, however, by the hour, the men on the twelve-hour basis receive the lowest rates of pay of all the private and municipal undertakings. This twelve-hour system, resulting from the smashing of the union and the overwork of the employees, is approved in some quarters as a "genuine example of co-operation."

At the other extreme the least amount of work required of stokers is in the municipal undertaking at Manchester, and there the reduction in the amount of work has been criticized as indicating a detrimental influence of trade unions upon the municipal undertaking. A question of this kind must be decided according to the opinions of the investigators. Looking at the severity of the work it would be unwarranted to say that the stokers in the Manchester municipal undertaking are doing a smaller amount of work than should be fairly required of them. An important consequence of the policy of the Manchester municipality in its effort to avoid overworking the stokers is seen in its effort to greatly improve the equipment of the plant in order to reduce the amount of labor required, the net result being that the labor cost in Manchester is not greater than in other places.

In the United States the gas workers are on the twelve-hour day at Richmond and Atlanta, but in the municipal plant at Wheeling all employees have the eight-hour day, while with the private company at Philadelphia the shift men in the retort house were placed on the eight-hour day when the company took possession. They had worked twelve hours under municipal ownership. The wages paid by the Richmond municipal plant, all of whose employees are whites, are 90 per cent. to 100 per cent. higher than the

wages paid to negroes who do similar work in the Atlanta private undertaking, and the wages paid to white mechanics and apprentices at Richmond are 30 per cent. to 120 per cent. higher than those paid to the corresponding white employees by the Atlanta company. In one occupation, that of the bricklayer, the wages in the two places are the same.

In the electric industries in Great Britain, outside of employment of unskilled labor, there does not appear to be any material difference in the rates paid by the municipalities and the private companies taken as a whole. It was not possible to make an exact comparison on account of the differences in classification and the wide range of wages, depending partly upon the size of the undertaking. Such differences as were found to exist between municipal and private undertakings might be explained upon the basis of the differences in the level of wages in the several localities.

In the United States in all cases, except South Norwalk and Detroit, the wages paid by the municipal electric undertakings are materially higher than those paid by the private undertakings of the same localities. The widest difference is found in Allegheny and in Chicago. The only positions in which the private electrical companies of Chicago pay as high wages for similar work as the municipal undertaking is that of a small number of their wiremen, who work alongside the other organized building trades of the city. Their other wiremen doing the same work get less pay.

In the matter of "welfare work," or provision for the comfort, cleanliness and recreation of employees, the best conditions were found in the works of the Commonwealth Electric Company at Chicago, the municipal water works at Cleveland, the Philadelphia gas works, the municipal gas at Leicester, municipal trams at Glasgow and Liverpool and South Metropolitan gas at London. The worst conditions were at Wheeling and Richmond municipal gas and Sheffield private gas. In general, the buildings and works constructed during the past four or five years both in private and municipal undertakings, show a great improvement over the older buildings and works, in the provision for baths, lavatories, lunch and cooking rooms, recreation rooms and grounds. Taking the entire list of properties visited, the best under one form of ownership is equalled by the best under the other form, and so on down to the worst. The superior character of the municipal undertakings over private undertakings in Great Britain is partly owing to their more recent construction and the converse is true in the United States.

In Great Britain, but not in the United States, were found systems of insurance, thrift funds, sick, death and accident benefits, both in municipal and private undertakings. The most extensive and elaborate of these is that of the South Metropolitan Company, connected with its system of profit sharing and compulsory investment of profits in the company's stocks. This system is ingeniously contrived to destroy the gas workers' union by subjecting its employees to the conspiracy laws, and to enable the company to "con-

tract out" from the Workmen's Compensation laws. The municipal gas works of Glasgow has copied the system so far as it relates to profit sharing and conspiracy, but not to workmen's compensation. All other municipal and private establishments pay accident benefits as required by this national legislation.

MUNICIPAL OPERATION VERSUS PRIVATE OPERATION OF MUNICIPAL MONOPOLIES

General Introduction.

NOTE—It was deemed advisable that the principal facts relating to the investigation should be gathered in concise and simple statements, and the leading interpretations of the data collected by the Commission and its experts be made available to all with a minimum expenditure of time and effort, and freed so far as possible from all technicalities for the benefit of those who may not have the time or technical knowledge enabling them to interpret for themselves the schedules and other sources of information upon which this report is based. And in order that such statements might be made from various points of view, the Commission appointed a Committee of Four with power to write collectively or individually according to any plan the members might deem best. This Committee consisted of Prof. E. W. Bemis, Superintendent of Water Works, Cleveland, Ohio; Prof. Frank Parsons, for many years a lecturer in Boston University Law School, and a writer on law and economics; Mr. Walton Clark, Third Vice-President and General Manager of the United Gas Improvement Company of Philadelphia, which controls the gas works in about fifty cities and towns in the United States, and a Director also of the Public Service Corporation of New Jersey, which owns nearly all the street railways and gas and electric companies in that State, and Mr. Charles L. Edgar, President of the Edison Electric Lighting Company of Boston.

Clark and Parsons remained abroad for several weeks after the Commission as a whole completed its investigation in Great Britain, and spent much time in the collection of additional data, the latter devoting special study to tramways and electric light; for tramways in Great Britain and electric light in the United States were the topics on which he was to write according to the original division of the work of the Committee of Four.

While this work was in progress, Prof. Parsons became seriously ill, and at his request Dr. Milo R. Maltbie consented to act on the Committee. Before the Committee completed its work Prof. Parsons recovered sufficiently to return to it.

Mr. Edgar also became indisposed and Mr. J. W. Sullivan acted for a time in his place, but after a few weeks was called out of the country and Mr. Edgar returned to the Committee.

According to the plan of work finally adopted, the Committee divided into two parts, each making a statement covering the investigation.

The General Introduction, the sections on British street railways, and the General Conclusions were prepared by Prof. Parsons; the American sections, on water, gas and electric light plants in the United States, and the Introduction to the same, were prepared by Prof. Bemis; the Introduction to the British Sections and the sections on gas and electric light plants in Great Britain were written by Dr. Maltbie. All three writers co-operated throughout the report in the furnishing of materials, making suggestions, etc.

From among the several foreign countries which might have been selected as a field in which to investigate the comparative re-

sults of municipal and private management, Great Britain was chosen by the Commission as on the whole the most important and attractive for the purposes of this research. The reason was not that municipal operation has been attended with greater success in Great Britain than in any other country, for it is believed that the greatest superiority of municipal enterprise is to be found in Germany, but Great Britain more closely resembles the United States than any other foreign country. The similarity of social institutions and especially of political principles and ideas makes the experience of each nation of great interest and value to the other, and this is true particularly of municipal government and the problems which confront American cities. In municipal systems Great Britain has passed through the stage of evolution in which our larger cities find themselves to-day, and as British cities, which are recognized as among the best governed municipalities in the world formerly experienced a period of corrupt and inefficient administration similar to that which now afflicts many of our large American cities, the story of British successes and failures in this field constitutes a very instructive record for us. There are still other reasons why Great Britain is the country best suited for our study, among which we may note, first, that public and private plants in the various lines of municipal service exist there side by side under like conditions, and under legal and social regulations calculated to secure great publicity and accuracy of accounting; second, that almost every conceivable method of control and management of public utilities has been tried, so that the present system is based on large experience with other methods.

This sub-committee is in sympathy with the municipal ownership movement, and none the less so in view of the results of the present investigation, but has made an earnest attempt to state the facts on both sides of the question in exact accordance with the schedules and other sources of information of the highest character, and to formulate accurately the broad statements that sum up the individual facts.

A fair comparison of public and private operation of public utilities calls for the study of four groups of facts—the economic group, dealing with finance and service; the labor group, the political group, and the social group.

Care must be taken to emphasize the various facts and groups of fact in proportion to their relative importance. Too much attention is generally given to the purely financial side of the question. The financial facts are important and voluminous and must be carefully considered, but there are other things still more important than finance. The fundamental test of any institution, method or service must be its effect upon the public good, its relation to morals, manhood, government, civilization and progress; and in applying this vital test the principal emphasis must be placed, not upon financial results, but upon human results; not on money, but on manhood. The character product and social product of our institutions are of greater moment than their money product.

Economic facts and causes underlie and determine in large measure the other elements of the problem, but it is the human aspects of these facts, and not their purely financial aspects, which constitute their chief importance. There is in the United States a tendency to worship mechanical efficiency regardless of moral efficiency and social efficiency. We find even men of high ability and large affairs, especially men connected with public service companies, habitually placing over-emphasis upon the cost of production and the physical output per worker and practically ignoring the character product and the political and social effects of the system considered; linking with their devotion to mechanical efficiency a disregard of the type of man the industry is evolving and a contempt of government, the defects of which are not infrequently due to the apathy and sometimes to the unsanctified activity of these very men and others influenced by them. So it is of the highest importance that the true emphasis shall be placed upon the various elements of the problem we are dealing with. False conclusions must inevitably be the result of the misplacement of emphasis or error in the relative value and weight accorded to different classes of facts. The question of economic efficiency is very important, but still more important are the questions: "Who gets the benefit of the efficiency?" and "What are the effects on character, government and society, of the methods used in securing efficiency?"

The economic effects of public and private ownership are fully brought out in the following section. Broadly speaking—recognizing the fact that there are exceptions to all rules—the investigation shows that municipal plants tend to make lower prices to ordinary consumers than private plants in the same country, working under similar conditions, and they do not grant rebates on light or other favors by secret agreement with large users, as is not infrequently the case with the larger companies. In the comparatively few cases where municipal systems do not make low charges, the public still gets the benefits that under private operation go to stockholders; for the profits of the public plants are used to improve the service, pay off the capital, relieve taxation, or accomplish some other public purpose. Municipal plants are found as a rule to have a lower capitalization than private plants, both in relation to output and in relation to assets. Private water, light and transit companies are prone to inflate their capitalization far beyond real values in order to conceal their actual rate of profit or cover some liability incurred in promotion or otherwise; or if they are prevented from positive inflation by laws requiring the auction sale of stock or other effective legislation, they can still secure a negative inflation by refraining from writing off the due amount for depreciation and letting the capital stay on the books long after the rails, engines, dynamos, etc., purchased with it are dead and in the scrap heap, or they can build up the plant out of earnings and charge to capital the cost of improvements paid out for revenue, thus compelling the public not only to pay cost and dividends for water, light or transportation, but also to furnish, in the form of excessive charges, the

capital for extending and improving the works which should be supplied by those who own the plants.[3]

In this connection we found of great advantage the English system of uniform accounting, careful audit and thorough publicity, and the valuations of the physical assets of public service plants, both public and private, which our experts were allowed to make. The public is entitled to a knowledge of real values, for, without it, it is impossible to test the fairness of capitalization or charges. No machinery of sliding scales, maximum prices, state regulation of rates, auction sales of stock, or limitation of stock issues, dividends, profits, etc., can protect the public without a knowledge of the physical value of the plant and the actual investment or amount paid in on the securities. Wisconsin has passed a law providing for the annual valuation of all the public utilities in the state, whether they are under public or private management. Prof. John R. Commons, of the Wisconsin University, who was largely instrumental in framing this law, says: "Each municipality should have power to regulate rates, charges and services, subject to appeal to a state commission, and instead of relying on control of the issue of stock and bonds, this commission should ascertain the reasonable value, including the physical value, of all the property of public utilties as a basis of rate regulation."

Labor and politics have been discussed by Prof. Commons and Mr. Sullivan, and we shall reserve our own conclusions on these points, and on the social effects of the two systems, for the closing section of this report. But the guiding principles and test questions which should be kept in mind in investigating the political and social aspects of the question, must be stated here. It is claimed on the one hand that public service companies constitute one of the chief causes of political corruption in our big cities, and that the removal of this cause through the development of public ownership of public utilities is one of the surest means of improving political conditions. On the other hand, it is affirmed that the governments of our larger cities are tainted with graft, partisanship and the spoils system and are unfit to be entrusted with the management of these important industries. It may be that there is truth in both these propositions. The relative amount of truth in each, and the inferences to be drawn from it, depend upon the answers to be given to these two questions: 1. How far is the bad government of our cities due to the influence of public service companies

[3] The Sheffield Gas Company supplies an excellent illustration. The management has built up the plant out of revenues to the extent of $3,000,000, or more, and has done this in the teeth of the law which requires that surplus above 10 per cent. dividends should be used for reduction of charges, so that the public in addition to paying the company all costs and large profits has had to pay for more than a third of the plant. In equity the $3,000,000 belongs to the consumers or their representative, the municipality, but, in fact, if the city decides to purchase the undertaking, it will be compelled to pay the full value, although the consumers have already paid $3,000,000 of that amount in the price of gas.

on political life, the civic standards thus established and the type of character and citizenship they tend to create, and how far is it due to other causes? 2. How far can public ownership of public utilities, with the wider sphere of civic activity which accompanies it, be depended on to develop a stronger civic patriotism and a more effective demand for honest and efficient administration? We hope that the facts we shall review will throw much light on these important questions.

We were told by leading men in England that the abolition of the old regime of corruption in British cities was largely due to the development of municipal ownership; that the companies behave well now, because they know their works will be municipalized if they do not and because the growth of municipal ownership has evolved a public sentiment and a type of character that will not tolerate civic abuses;[4] that public spirit and civic patriotism have grown as the increase of public business enlarged and intensified the demand for them; and that the way for America to secure the civic honor and devotion that underlie the clean management of both public and private plants in Great Britain is to develop public ownership of public utilities.

For example, the Rt. Hon. John Burns, the famous progressive leader in the London County Council and in Parliament, and now president of the Local Government Board, and one of the highest authorities in the world on questions of municipal policy, said to the Commission:

"Some of you may be asking yourselves the question whether you can do in America what has been done in England. I have been in America several times and am somewhat familiar with your political and municipal conditions, and if some of you are thinking, 'Can America do what England has done?', let me say that if you want to develop a public spirit (of which I think you possess more than your detractors would have us believe), you cannot do better than to develop a new school of civic statesmanship through municipal undertakings. In the laboratory of public ownership, from the social crucible there will emerge a new statesmanship that may solve your problems of government in the best way.

"If you are ever going to have such a public spirit as we have in England, you must make a beginning, and you cannot make a better beginning than by undertaking those forms of municipal trading which are so successful here. In their administration will be developed a new sphere of public activity for your young men. In that work scope will be found for their activities in adding to public comfort, profit and elevation."

[4] It seems to be the general opinion in England among thoughtful people that the good behavior and efficiency of the companies is due very largely to the stimulation of private management by public works whose acts, results and policies are open to easy knowledge and comparison, and to the ever-present probability of municipalization if the conduct and results of company management do not prove satisfactory to the public.

In Great Britain now the public service companies are so far dominated by the public interest, acting through the law, that they are quasi-public; while in America the public service companies so far dominate the government that it is often quasi-private. The conclusions of John Burns, Sidney Webb, Robert Donald and other high authorities in Great Britain, to the effect that the elimination of political corruption and the spoils system in their country is largely due to the development of public ownership, certainly call for our careful thought. To an American the danger seems very real that an enlargement of public functions in some of our cities would simply result in enlarging the opportunities of grafters, bosses and machines. This is not necessarily inconsistent with the views of the distinguished publicists above referred to. For the country as a whole and in the long run, and for municipalities having sufficient public spirit to respond to the stimulus of added civic activities and responsibilities, the growth of public ownership may be a prime factor in civic development; and it may still be true that, in a city where there is so much civic apathy and indifference among the better classes that they will not respond in due degree to the stimulus of municipal ownership, the immediate effect of enlarging the sphere of public business may be to exchange one class of political evils for another—diminishing or perhaps abolishing legislative corruption but adding to the volume and strength of the spoils system and boss rule. In other words, the political effects of public or private ownership in any given community may vary greatly according to the degree of civilization, intelligence, public spirit and civic development the city has attained.

One of Herbert Spencer's favorite methods of testing truth and value is to study the movement of thought and events and note what policies and institutions grow in strength with advancing civilization. The application of this method to the history of public and private operation leads to very interesting results. From 1800 to 1900 public water works in the United States developed in round numbers from 6 per cent. to 60 per cent. of the whole number.[5] Of the 50 largest cities in the United States, 21 originally built and now own their water works, 20 have changed from private to public ownership, and only 9 are now dependent on private companies for their water supply. Some of the remaining 9 appear to be on the point of changing to municipal ownership, and practically all of them are in process of agitation for such a change.

In gas the public plants of the United States numbered 15 in 1900 and 25 in 1906, a growth of 67 per cent., against an increase of 48 per cent. for the private gas works in this country. In 1881 there was but one electric lighting plant in the United States. The Census Bureau reports 818 public plants in 1902. The central station list for 1904 gives 927 public plants, and the number

[5]According to the study in Baker's Water Manual of 1897 there had been 205 changes from private to public ownership and only 20 changes the other way. (See Equity Series, "City for the People," p. 204.)

is now estimated on high electrical authority at more than 1,000. The census report shows that 13 plants had changed from private to public operation for each plant that had changed the other way.

Municipal ownership of street railways in this country is as yet in embryo.[6]

In Great Britain over three-quarters of the water works are owned by the local authorities. More than half the gas supply outside of London has been municipalized; more than half the electric lighting plants belong to municipalities, and about half the tramway undertakings are owned and operated by municipalities with nearly 60 per cent. of the total track mileage. How rapid has been the development in this field may be seen from the fact that when Leeds and Glasgow adopted the policy of municipal operation in 1894 only three municipalities, Huddersfield, Plymouth and Blackpool, had public tramways. In the next twelve years, 1895 to 1906, more than 70 of the larger towns and cities followed the example of Glasgow, and the only places in the kingdom of any large importance that have not adopted the policy of municipal operation are Dublin, Bristol and Edinburgh.[7]

The main causes of this movement for the municipalization of public utilities are to be found in the desire: 1. To secure a better and more extended service. 2. To obtain lower rates. 3. To secure for the city the profits of public service industries. 4. To improve the conditions of labor. 5. To identify the interests of owners and the public and bring into harmony with the public welfare powerful monopoly interests, which in private hands manifest more or less opposition to the public good. 6. To secure to the city, direct,

[6] A municipal street railway system in Monroe, La., was opened for business August 1, 1906. Mayor Forsythe says the enterprise is so successful that "the net receipts will equal principal and interest of the total cost in about seven years." It is stated further that the system has recently been extended eight miles to a suburban park, in which the city offers free bathing and boating to all who care to avail themselves of the privilege. The Municipal Journal and Engineer of November 28, 1906, says of this undertaking: "Two years ago the success of the city's move in taking over the water and lighting plants moved the Mayor and citizens to go before the State Legislature and have the city's charter changed so as to permit it to own and operate the street railway system. The system is said to be first-class in every respect."

A street railway service over the Brooklyn Bridge was owned and operated jointly for some years by the cities of New York and Brooklyn with entire honesty and marked success, but was finally leased to the elevated in order to unify the service so that travellers would not have to change cars after they crossed the bridge. The municipality of Guelph, Ont., also operates a small street railway, the cause of municipalization being stated to be "public demand and failure of the private corporation to make a success." Toronto, Can., bought her street railways with the view of leasing them for company management under a contract providing for a large degree of public control, and in the interim between the old and new company managements, the city operated the lines.

[7] In Germany also rapid progress has been recently made in the municipalization of street railways, some thirty of the leading cities having adopted municipal operation in the space of a dozen years.

continuous and complete control of its streets and all monopoly uses of them. In the United States the principal causes of the municipal ownership movement have been the tendencies to over-capitalization, excessive charges and disregard of public health and safety, manifested by private companies, and their corrupt and demoralizing relations with our governments and public officials.

One of the prevalent errors in regard to municipal ownership in Great Britain is the current statement that it has resulted in a serious increase of debt and taxation, adding greatly to the burdens of taxpayers. Local debt and taxation have increased in British cities in recent years, but the debts incurred for revenue producing properties like water, gas, electric light and tramway systems have not on the whole increased the burden upon the taxpayers. On the contrary, the public service plants of Great Britain yield the municipalities millions of net profits every year. In many cities the lighting and tramway systems, in addition to paying regular taxes just as if they were private plants, pay into the public treasury a large sum annually "in relief of the rates" or reduction of the general rates of taxation. Thus they lessen the burden resting upon the taxpayers instead of increasing it. For example, the Manchester tramways paid in round numbers last year, 1906, the sum of $230,000 in relief of rates and the public trams of Leeds paid $250,000 in aid of rates the same year. The four municipal street railway systems selected for special investigation, have paid over $4,000,000 into the public treasury in relief of taxation. The Manchester gas works, selling gas at an average of 52 cents per thousand feet, report for 1906 a profit of $764,000 above operating costs, including taxes, and out of this profit $250,000 was paid in relief of taxation. Since their commencement the Manchester gas works have paid $13,000,000 into the public treasury in relief of rates. Birmingham gas pays $260,000 annually and in thirty years has paid $6,180,000 in aid of rates. The total benefit to the citizens of Birmingham from municipal ownership in reduced charges, relief of rates and net profits is estimated at more than $8,000,000.

In a few of the smaller places where neither a public nor private plant could expect to make a profit, the rates are burdened to some extent on account of public service plants just as they are on account of highways, schools, etc., but this is the exception. In the great majority of cases the balance is the other way. The increase of local taxes in Great Britain has been due in the main to increased expenditure for education, sanitation, the clearing of slums, etc., and not to the public service plants. Our investigation also shows that the tax rates are lower in the public ownership cities than in the cities retaining private lighting and transit service.[8]

In comparing British and American systems allowance must be made for differences of condition and the influence of national

[8] See Special Report on Taxation, by M. R. Maltbie in Vol. III.

causes. The literature of this subject is full of fallacious inferences resulting from failure to observe the principles of true comparison. For example a comparison of the per capita use of electricity in Great Britain and the United States, or the street railway mileage per thousand of population, or the passenger rides per inhabitant, proves nothing in regard to public or private ownership, but only that the United States is ahead of Great Britain in some respects. Our people demand more light and are able to pay for more light than the British people. Our buildings, telephones, factories, farms, commercial enterprises, etc., also show a decided superiority, although these things are subject to private ownership in both countries. The per capita use of typewriters, sewing machines, automobiles, elevators and telephones, is greater in the United States than in Great Britain, as well as the per capita use of electricity and mileage of tramways. The habits of the people and their economic conditions are widely different in the two countries. The best method of arriving at a conclusion in regard to the effect of the form of management upon the service is to compare public and private plants in the same city or in the same country under similar conditions otherwise than as to ownership.

A fallacious idea in regard to municipal efficiency has become current in this country through the focussing of attention on the worst instances of municipal maladministration in our big cities, and comparing them with cases of well-managed private industry. But it is not logical to judge municipal efficiency by such examples any more than it would be fair to judge the food quality of fruit by examining the nutritive value of rotten apples. The history of public utilities in Great Britain (and Germany also), demonstrates that there is no inherent lack of efficiency in municipal administration. The shortcomings of some of our cities, therefore, do not constitute a valid argument against municipal operation, but an argument for careful consideration, whether it is wise to establish municipal operation in those cities at the present time, and an argument for the civic improvement of such cities, which may or may not involve a development of public ownership as one of the possible means of civic regeneration according to the principles already stated.

In comparing one plant with another in respect to efficiency, allowance must be made not only for differences in location, cost of coal, etc., but also for differences in policy which may involve expenditure for other than economic purposes. Where a public management pays 20 or 30 per cent. more wages than the company it replaces, and works the men 60 hours a week instead of 77, 84 or 91 hours, a part of the increase may properly be regarded as economic expenditure for increased efficiency, but a large part of such concessions to labor are not for economic purposes. All that is paid beyond what is necessary to pay in order to secure equally effective labor is not a payment for economic efficiency—not a payment for light and transit, but an investment in citizenship and social development belonging to the same class as payments for the public schools, or for clearing unsanitary or congested areas.

Two other fallacies that are very prevalent in dealing with the data of this subject may be noted here.

First, it is bad reasoning to infer that our cities under existing economic and political conditions can secure results from municipal ownership like those attained in British cities without separating business from politics and giving careful attention to the methods that have made municipal ownership successful in Great Britain. An energetic citizen reads that municipal ownership in Glasgow, Liverpool, Birmingham and other cities, has reduced rates, raised wages, shortened hours, improved the service and put large profits in the public treasury, etc., and he immediately demands legislative action for the establishment of a municipal lighting or street railway system in his city or town, without investigation of, or provision for, the conditions of success. There is strong reason to believe that municipal ownership does tend to produce such results, but there is abundant evidence that this tendency may be overcome by adverse circumstances. It will not do to neglect these circumstances any more than it will do to neglect the soil in which you plant grain or vines or fig trees. The conditions of success must be carefully attended to in the establishment of municipal works as well as in the establishment of private enterprises.

Two great questions are involved in the municipal ownership movement. The first is the broad question of public policy Which is the better system on the whole, the public ownership of public utilities or the private ownership of public utilities? Which is the most in harmony with justice and the best interests of the community? Which plan, under fair conditions, tends to produce the best results all around? The second question is whether local conditions are or can be made such as to afford a reasonable basis for securing the successful operation of the public enterprise under consideration in the specific case. The neglect of either of these questions may lead to serious error.

Second, the claim that British success is no guide to what can be done with municipal ownership here is fallacious. A man who jumps to the conclusion that we cannot have municipal ownership in Chicago or any other American municipality because existing conditions here are different from those we find in Europe, makes quite as great a mistake as the man who ignores existing conditions entirely. The oak grows in more than one kind of soil, and municipal ownership comes to full bloom under more than one set of conditions. A barren soil can be fertilized and political conditions can be changed.

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UNITED STATES—*Introduction.**

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caps in the United States as to render competition with municipal plants on equal terms a difficult task in our more advanced communities. The task has been hitherto rendered easy in the majority of our large cities, because of the spoils system and other political conditions that are now fortunately beginning to pass away. Private companies in several cases before the New York State Lighting Commission and the United States Courts have advanced the claims upon which most of such companies have practically been acting for years. These claims, which in May, 1907, were endorsed by a referee of the United States Courts in the Consolidated Gas case, are such a handicap upon the ultimate success and popularity of private ownership as to render it certain that as soon as our cities are able to secure even moderately good engineering and business management the superiority of municipal operation of public service monopolies will be assured.

Our private companies are asserting with much success the right to capitalize and earn 6 per cent. to 10 per cent. on the following items in addition to the necessary cost of their plants.

First, the increased value of their land since it was purchased, although no more useful for their purposes than when it was bought; second, the increased cost of duplicating their buildings and machinery to-day, because of the rise in prices of materials and labor; third, the increased cost of the mains because of the higher prices of labor and material; fourth, the increased cost of duplicating the mains compared with the original cost, because of the expense necessary to-day to cut through the paving which has been placed over the mains at the expense of the taxpayers since those mains were laid. To be sure, any increased cost of repairs and renewals on account of paving is charged into operating expenses. Lighting and conduit companies, nevertheless, claim the right to capitalize all paving put over their property at the expense of the taxpayer. Fifth, the companies also claim the right to capitalize at a large sum, which the Syracuse Gas and Electric Light Company asserted was worth $25 a head, the established connections they have secured with consumers. All expenses of canvassing and soliciting new business are charged into operating expenses, and a monopoly cannot possess good will, yet the capitalization of all business connections with new consumers is now made much of by those holding monopoly rights in our streets. Sixth, companies also claim the right to capitalize their franchises or rights given to them by the community or existing on sufferance. The franchise value would appear to be a capitalization of monopoly earnings or of special privileges. These are becoming greater and greater in value with the growth of every community. The monopoly prices charged make the franchise value, but the companies claim that the price cannot be reduced, because such action would reduce the value of the special privileges produced by those very high prices.

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than 10 per cent. on a value, that would include all of the above items save possibly franchises, is the least that the courts should allow. A member of this Committee of Twenty-one, Mr. Walton Clark, on April 30, 1906, stated in a deposition in the New York Consolidated Gas case, "as a result of my experience, it is my opinion that a rate should not be fixed which will necessitate a lower return than 10 per cent. upon the investment in new gas works in New York City," while a well-known member of the Commission which created this Committee of Twenty-one, Mr. Alexander C. Humphreys, stated under oath in the same case that, as a result of extended experience, he has found that many gas companies, both in this country and abroad, pay dividends of 10 per cent. and more. On the other hand, as this investigation shows, municipal plants have to pay only about 3 per cent. in Great Britain, and 4 per cent. in the United States, for the actual capital borrowed, and this capital does not include the increased value of land with the age of the works, nor the increased cost of material and labor since the plant was built, nor the paving put over the mains and services at the expense of the city, which is not an expense due to the pipes or wires buried underneath. Likewise, the municipal plants do not have to pay any 5 per cent. to 10 per cent. return on the value of the business or connections established with consumers and paid for once out of the operating expenses of the business, nor do they have to pay any interest on their rights in the streets.

Furthermore, municipal undertakings earning any revenue in excess of operating expenses, depreciation and interest are accustomed in America to pay off their indebtedness therewith, and thereby relieve the customer in the future of even any interest charge. Where a municipal plant, therefore, has only to earn 4 per cent. on its original cost and nothing thereon after the plant has been paid for out of earnings, it is only possible for a private plant to earn the far larger returns mentioned above by either high charges or by vastly superior management. That such superior management has often prevailed, and still prevails, in many cities must be admitted, but that it everywhere prevails or will continue to exist in the majority of our cities is quite another question. Certain it is that as soon as our cities have as good business management as private companies they will show vastly better financial returns for the user and taxpayer, to say nothing of the higher civic spirit which successful municipal operation appears to develop.

Municipal ownership in the United States has not as yet had a fair trial except in the supply of water. Most of our larger cities have no right under the existing state laws and constitutions to own and operate street railways or to sell electric light and gas for commercial uses. Otherwise Detroit and many other of our important cities would long ago have directly provided for their citizens street railways and light and power for commercial and domestic uses.

The nature of the present investigation, valuable as it has been, has prevented a proper presentation of the reasons that have

so strongly developed the municipal ownership movement in America during the past few years. We have attempted to compare a few of the best known, although often not the most efficiently managed, municipal plants with the best private plants in the same section of country. This answered fairly well for Great Britain, as elsewhere pointed out. It has developed that even in Great Britain the municipal plants selected because of their general fame are not in most cases those furnishing electricity or gas at the lowest cost of operation or the lowest price among the municipal undertakings, while the private plants selected were at the head of the list of private plants in those respects. In the United States this method of comparing the best known municipal undertakings with the best private plants in the same section of country broke down at the very start by the early recognition of the impossibility of getting such data from similar private undertakings. No effort was therefore made to secure an appraisal of the private plants and to compare it with their outstanding stocks, bonds and other liabilities. We were universally assured that such an effort would be fruitless. If, however, it had been possible to accomplish this there is every reason to suppose that the financial superiority of municipal undertakings with regard to the high ratio of assets to liabilities, which is so conspicuous a fact in Great Britain, would have been found still more striking in the United States in the water and gas works and in the electric light plant of South Norwalk. This alone of the municipal electric light plants examined has any revenue from commercial uses with which to take care of depreciation and to pay for the plant.

Not only, however, was the American investigation deprived of the opportunity of making an appraisal of the private plants, but it was also deemed useless to have our accountants report upon the various methods of keeping accounts, the true operating expenses, etc. All that was attempted in the line of comparison was to study the general engineering features of certain public and private plants, their rates of charge, the character of service rendered, and general labor and political conditions. Even this limited study was further restricted by our inability to make any comparisons at all with some of the cities that had been selected; for example, it was planned to compare the excellent South Norwalk municipal lighting plant with the private plant at Geneva, New York, which was chosen because of its supposed similarity of conditions. It was also planned to compare the Allegheny municipal lighting plant with the private Pittsburgh plant, situated in the same environment and in the same political conditions. It was also planned to compare the Syracuse Water Works with those of Utica, which obtain their supply by gravity, as does Syracuse, and could therefore be compared with it. Both cities also meter most of their services, which still further would facilitate comparison, but in all these cases the private companies failed to respond favorably to our request.

The same was true of the municipal gas works of Richmond, for reasons which will be explained in the sections that follow. Unfortunately, some comparisons between eight small municipal and eight small private electric light plants, which will be printed in a subsequent volume, arrived too late for analysis in this chapter. Some comparisons, however, are instituted between the municipal plants studied and the private plants of Utica, Pittsburgh, and a few other cities. No study, however, of special plants will adequately reveal the full weight of the argument for municipal ownership. The two great reasons for the municipal movement are the over-capitalization and high earnings thereon of the private companies, and the demoralizing relations often existing between private companies and city governments. According to the so-called Red Book of American Street Railway investments for the year ending May 1, 1906, the street railways of Massachusetts have a stock and funded debt of $51,237.00 per mile of single track, while the street railways in the rest of the United States, with only two-thirds as many cars per mile of track, have a stock and funded debt of $108,457 per mile of track.

The special report of the United States Census on Central Electric Light and Power Stations for the year ending June 30, 1902, gives the outstanding stock and bonds of the 2,805 private electric light companies of the United States as $627,515,875, and their annual output as 2,311,146,676 kwh., or $271.51 capitalization per 1,000 kwh. On the other hand, the cost of the 815 municipal electric light stations was given as $22,020,473, and their annual output as 195,904,439 kwh., or only $111.89 per kwh. In other words, the cost of the municipal plants was only 41 per cent. per unit of electricity sold of the capitalization of the private companies. Even where the capitalization has been kept down for several years by state law, as in the case of the Massachusetts gas companies, the return on that capitalization is nearly twice the rate at which the Massachusetts cities are able to borrow.

The greatest reason of all, however, for the strength of the municipal ownership movement lies in the relations of the public service corporations with our state and local governments. The companies seek to control these governments to avoid being controlled by them in the assumed or real interest of the public. Private companies naturally desire to manage their railway and lighting plants, not in the public interest, but in their own interest. To this end they seek to control nominations and elections, and when they want special privileges they do not hesitate in many cases to use whatever form of influence may be necessary to secure them. Men of undeveloped conscience, elected often by corporate influence because they are open to corporation methods of persuasion not infrequently turn upon the companies with blackmailing and sandbagging measures in order to forward their own private purposes. So the companies are between two fires and in both ways their relations with our governments are destructive of political purity, democracy and free institutions. The public has an inkling

of the pressure the franchise companies bring to bear upon our legislative bodies, but it has little idea as yet of the pressure that legislators bring to bear upon the companies. In the recent report on municipal ownership made by the committee of the American Street and Interurban Railway Association (Street Railway Journal, May 11, 1907, page 842), the committee says: "Your committee hold no brief for the defense of corporations who have debauched councils, and by the use of bribes in the shape of securities or of cash have secured privileges, even though the request for such privileges in and of itself was often entirely proper. * * * If the inner history of the companies represented by this association could be accurately written and spread in full upon the public books, it would cover a list of *refusals to purchase privileges,* or rather, in many instances, permission to do that which was altogether advantageous to the city in which the company operated and to the people whom it desired to serve, even at the risk of attack, misunderstanding and unpopularity that would be *surprising in number and wellnigh continuous.*"

The only instance of direct financial corruption brought to the attention of the committee by any of our experts was given to us at our Cleveland meeting and affected one of the private companies investigated. The magnitude and number of the questionable methods which had for a time prevailed there in the making of contracts for machinery and supplies would have attracted national attention if discovered in the case of a municipal plant.

With the rapid growth of large cities there arise problems of education, sanitation, parks, playgrounds, public buildings, recreation, streets, sewers, paving, transportation, light, power, etc., which demand a far stronger and more efficient government than does the village or the rural community of years ago. The tendency of thought among our giant privately owned monopolies is to look down upon government, put weak if not corrupt men in charge of the same, and to lessen its efficiency in every way. The people do not feel the civic pride in a privately owned lighting plant or street railway company, no matter how well managed, that they do in such of their publicly owned utilities as are well managed and successful. This is a most serious weakness in the private ownership of our city monopolies.

WATER WORKS—Selection of Plants.

The growth of municipal ownership of water works in the United States has been remarkable. Of the 16 plants in operation in 1800, 15 were then private, but all have now become public, with the exception of the comparatively small city of Morristown, N. J., which had a population of only 11,267 in the census of 1900. Of the 38 cities having a population of over 100,000 in 1900, only 8—San Francisco, New Orleans, Omaha, Indianapolis, St. Joseph, Scranton, Paterson and New Haven—have private ownership. One of these, New Orleans, will soon become municipal, and Omaha is only hesitating over the question of price to be paid for

the existing plant, while there is a growing agitation for municipal ownership in some of the remaining seven. Of the thirteen largest cities, only one, San Francisco, which ranked ninth in size before the earthquake, has a private supply. Of the above 38 cities the population of the 30 having public plants was estimated by the United States Government at 14,909,071 in June, 1906, or 90 per cent. of the total estimated population 16,553,859, of these 38 places of over 100,000. Even in 1890 the population of all the cities having municipal water works was 66.2 per cent. of the total population in places supplied with water works facilities, and such large places as Los Angeles, Kansas City, Mo., and Syracuse have since changed to public management, while twice as many new plants have begun under public as under private ownership in the last seventeen years.

Causes of Growth of Municipal Ownership.

One secret of this more rapid transformation of water works than of gas has been the fact that water franchises have usually been for limited terms, and when the franchise expired the question was squarely presented to the people whether they preferred to continue private management. If the city did at that time prefer to take over the plant it was then possible to secure it without buying back at a large price a special privilege which the city had usually granted for nothing. In other words, cities have been able in many cases to get hold of water works by paying for their structural value plus a fair amount as a going concern, but without paying a large amount for franchise value or monopoly earnings, as has usually been necessary in the case of gas, where very long or perpetual franchises have been the rule.

The second cause of the popularity of municipal plants has been the control which cities can thus exercise, if they desire, over the sanitary quality of the water. To be sure, some private companies have provided an excellent supply of water, but on the whole, the cities having municipal works average a lower death rate from typhoid, which is the chief test of the sanitary quality of the water. Even with a perfect water supply a typhoid death rate of 10 to 20 per 100,000 is found in the largest cities of Great Britain, owing to the poor water in other places from which the disease may start, or to conditions in the city itself aside from its water supply. Nevertheless this test of the typhoid death rate is the most satisfactory one known as applicable to water. The United States Department of Commerce and Labor in its recent volume on "Mortality Statistics for 1905" has given the death rate per 100,000 in 37 of the 38 largest cities. In the first 18 of this list there are only 3 of the 9 private companies, while in the other 19 plants having the highest typhoid death rate are the other 6 companies. Likewise, if we work out the death rate per 100,000 for the 38 largest cities in 1906 from the estimates of population by the United States Government and from the returns of deaths from the boards of health, we find only 2 of the 9 private com-

panies in the best 19 cities, while the other 7 are in the 19 cities having the highest typhoid death rate. During the four previous years, 1901-4, there was little difference between the private and public undertakings, but during the eleven years before that, viz.: 1890-1900, only 3 of the 9 large private companies were in the fifteen cities having the lowest typhoid death rate out of the 30 large cities covered in Bulletin 15 of the Twelfth Census published in 1904.

A third reason for the popularity of municipal water works is the apparently low cost for fire hydrants and other public uses of water under that form of ownership. Private companies usually charge for fire hydrants and sometimes for other public uses of water, as is the case in Indianapolis. It is generally believed that the value of the free fire protection exceeds the taxes lost under public ownership. That this is true in respect to the plants especially studied by this Commission is shown by our accountants. (Schedule IV., Vol. II., pp. 401-2, 414-5, 423-5.)

Another reason for the popularity of municipal water works has been the belief that municipal plants would furnish more hydrants per mile of main and more and larger mains in proportion to the street mileage than would private companies. In this connection a quotation must be made from the secretary of the Committee of Twenty appointed by the National Board of Fire Underwriters to make exhaustive reports upon the fire-fighting facilities and fire risks of all the large cities of the country. Our experts have quoted from some of these reports in connection with the various water works examined. The most comprehensive survey of water works in the United States has been made at great expense by this Committee of Twenty through expert engineers in its employ. The secretary of this committee, Mr. S. H. Lockett, in his official and published "Analysis of Reports of the National Board of Fire Underwriters' Committee of Twenty," has made this significant comment:

"A careful consideration of the various factors entering into the problem of ownership leads to the belief that this topic cannot well be omitted. In works of private ownership we seldom find a contract or agreement of any kind stipulating in definite terms the quality of fire protection which shall be provided. Indeed, the question of supply for fire purposes involves so many elements widely different in character from those affecting domestic supply that it is difficult to draft a satisfactory binding agreement. The nature of the problem makes the returns on the investment larger and quicker in providing domestic service than in furnishing a good fire protection supply. The exploiting of the latter is not attractive to private capital. In other words, private owners of water works are not apt to appreciate fully the fire protection side of water works, as they are dividends. New roofs on pumping stations, larger mains, increased pressures, etc., eat into profits. And strictly speaking, they may not be necessary from the standpoint of private ownership. A water system, very poor from a fire protection viewpoint, might be, and often is, a profitable investment to its owners.

"Again, the service rendered by public and quasi-public corporations, including the domestic supply of private water companies, is affected favorably by the public's everyday contact. The available supply for fire purposes, however, is a reserve called into action but

continuous and complete control of its streets and all monopoly uses of them. In the United States the principal causes of the municipal ownership movement have been the tendencies to over-capitalization, excessive charges and disregard of public health and safety, manifested by private companies, and their corrupt and demoralizing relations with our governments and public officials.

One of the prevalent errors in regard to municipal ownership in Great Britain is the current statement that it has resulted in a serious increase of debt and taxation, adding greatly to the burdens of taxpayers. Local debt and taxation have increased in British cities in recent years, but the debts incurred for revenue producing properties like water, gas, electric light and tramway systems have not on the whole increased the burden upon the taxpayers. On the contrary, the public service plants of Great Britain yield the municipalities millions of net profits every year. In many cities the lighting and tramway systems, in addition to paying regular taxes just as if they were private plants, pay into the public treasury a large sum annually "in relief of the rates" or reduction of the general rates of taxation. Thus they lessen the burden resting upon the taxpayers instead of increasing it. For example, the Manchester tramways paid in round numbers last year, 1906, the sum of $230,000 in relief of rates and the public trams of Leeds paid $250,000 in aid of rates the same year. The four municipal street railway systems selected for special investigation, have paid over $4,000,000 into the public treasury in relief of taxation. The Manchester gas works, selling gas at an average of 52 cents per thousand feet, report for 1906 a profit of $764,000 above operating costs, including taxes, and out of this profit $250,000 was paid in relief of taxation. Since their commencement the Manchester gas works have paid $13,000,000 into the public treasury in relief of rates. Birmingham gas pays $260,000 annually and in thirty years has paid $6,180,000 in aid of rates. The total benefit to the citizens of Birmingham from municipal ownership in reduced charges, relief of rates and net profits is estimated at more than $8,000,000.

In a few of the smaller places where neither a public nor private plant could expect to make a profit, the rates are burdened to some extent on account of public service plants just as they are on account of highways, schools, etc., but this is the exception. In the great majority of cases the balance is the other way. The increase of local taxes in Great Britain has been due in the main to increased expenditure for education, sanitation, the clearing of slums, etc., and not to the public service plants. Our investigation also shows that the tax rates are lower in the public ownership cities than in the cities retaining private lighting and transit service.[8]

In comparing British and American systems allowance must be made for differences of condition and the influence of national

[8] See Special Report on Taxation, by M. R. Maltbie in Vol. III.

causes. The literature of this subject is full of fallacious inferences resulting from failure to observe the principles of true comparison. For example a comparison of the per capita use of electricity in Great Britain and the United States, or the street railway mileage per thousand of population, or the passenger rides per inhabitant, proves nothing in regard to public or private ownership, but only that the United States is ahead of Great Britain in some respects. Our people demand more light and are able to pay for more light than the British people. Our buildings, telephones, factories, farms, commercial enterprises, etc., also show a decided superiority, although these things are subject to private ownership in both countries. The per capita use of typewriters, sewing machines, automobiles, elevators and telephones, is greater in the United States than in Great Britain, as well as the per capita use of electricity and mileage of tramways. The habits of the people and their economic conditions are widely different in the two countries. The best method of arriving at a conclusion in regard to the effect of the form of management upon the service is to compare public and private plants in the same city or in the same country under similar conditions otherwise than as to ownership.

A fallacious idea in regard to municipal efficiency has become current in this country through the focussing of attention on the worst instances of municipal maladministration in our big cities, and comparing them with cases of well-managed private industry. But it is not logical to judge municipal efficiency by such examples any more than it would be fair to judge the food quality of fruit by examining the nutritive value of rotten apples. The history of public utilities in Great Britain (and Germany also), demonstrates that there is no inherent lack of efficiency in municipal administration. The shortcomings of some of our cities, therefore, do not constitute a valid argument against municipal operation, but an argument for careful consideration, whether it is wise to establish municipal operation in those cities at the present time, and an argument for the civic improvement of such cities, which may or may not involve a development of public ownership as one of the possible means of civic regeneration according to the principles already stated.

In comparing one plant with another in respect to efficiency, allowance must be made not only for differences in location, cost of coal, etc., but also for differences in policy which may involve expenditure for other than economic purposes. Where a public management pays 20 or 30 per cent. more wages than the company it replaces, and works the men 60 hours a week instead of 77, 84 or 91 hours, a part of the increase may properly be regarded as economic expenditure for increased efficiency, but a large part of such concessions to labor are not for economic purposes. All that is paid beyond what is necessary to pay in order to secure equally effective labor is not a payment for economic efficiency—not a payment for light and transit, but an investment in citizenship and social development belonging to the same class as payments for the public schools, or for clearing unsanitary or congested areas.

Two other fallacies that are very prevalent in dealing with the data of this subject may be noted here.

First, it is bad reasoning to infer that our cities under existing economic and political conditions can secure results from municipal ownership like those attained in British cities without separating business from politics and giving careful attention to the methods that have made municipal ownership successful in Great Britain. An energetic citizen reads that municipal ownership in Glasgow, Liverpool, Birmingham and other cities, has reduced rates, raised wages, shortened hours, improved the service and put large profits in the public treasury, etc., and he immediately demands legislative action for the establishment of a municipal lighting or street railway system in his city or town, without investigation of, or provision for, the conditions of success. There is strong reason to believe that municipal ownership does tend to produce such results, but there is abundant evidence that this tendency may be overcome by adverse circumstances. It will not do to neglect these circumstances any more than it will do to neglect the soil in which you plant grain or vines or fig trees. The conditions of success must be carefully attended to in the establishment of municipal works as well as in the establishment of private enterprises.

Two great questions are involved in the municipal ownership movement. The first is the broad question of public policy Which is the better system on the whole, the public ownership of public utilities or the private ownership of public utilities? Which is the most in harmony with justice and the best interests of the community? Which plan, under fair conditions, tends to produce the best results all around? The second question is whether local conditions are or can be made such as to afford a reasonable basis for securing the successful operation of the public enterprise under consideration in the specific case. The neglect of either of these questions may lead to serious error.

Second, the claim that British success is no guide to what can be done with municipal ownership here is fallacious. A man who jumps to the conclusion that we cannot have municipal ownership in Chicago or any other American municipality because existing conditions here are different from those we find in Europe, makes quite as great a mistake as the man who ignores existing conditions entirely. The oak grows in more than one kind of soil, and municipal ownership comes to full bloom under more than one set of conditions. A barren soil can be fertilized and political conditions can be changed.

The man who ignores the conditions of success, and the man who ignores the possibility of establishing the conditions of success are equally at fault.

UNITED STATES—*Introduction.**

Contrary to general belief, private ownership of lighting, street railways and water works suffers under such severe handi-

* The following paragraphs upon American conditions from p. 122 to p. 185 were written by E. W. Bemis.

caps in the United States as to render competition with municipal plants on equal terms a difficult task in our more advanced communities. The task has been hitherto rendered easy in the majority of our large cities, because of the spoils system and other political conditions that are now fortunately beginning to pass away. Private companies in several cases before the New York State Lighting Commission and the United States Courts have advanced the claims upon which most of such companies have practically been acting for years. These claims, which in May, 1907, were endorsed by a referee of the United States Courts in the Consolidated Gas case, are such a handicap upon the ultimate success and popularity of private ownership as to render it certain that as soon as our cities are able to secure even moderately good engineering and business management the superiority of municipal operation of public service monopolies will be assured.

Our private companies are asserting with much success the right to capitalize and earn 6 per cent. to 10 per cent. on the following items in addition to the necessary cost of their plants.

First, the increased value of their land since it was purchased, although no more useful for their purposes than when it was bought; second, the increased cost of duplicating their buildings and machinery to-day, because of the rise in prices of materials and labor; third, the increased cost of the mains because of the higher prices of labor and material; fourth, the increased cost of duplicating the mains compared with the original cost, because of the expense necessary to-day to cut through the paving which has been placed over the mains at the expense of the taxpayers since those mains were laid. To be sure, any increased cost of repairs and renewals on account of paving is charged into operating expenses. Lighting and conduit companies, nevertheless, claim the right to capitalize all paving put over their property at the expense of the taxpayer. Fifth, the companies also claim the right to capitalize at a large sum, which the Syracuse Gas and Electric Light Company asserted was worth $25 a head, the established connections they have secured with consumers. All expenses of canvassing and soliciting new business are charged into operating expenses, and a monopoly cannot possess good will, yet the capitalization of all business connections with new consumers is now made much of by those holding monopoly rights in our streets. Sixth, companies also claim the right to capitalize their franchises or rights given to them by the community or existing on sufferance. The franchise value would appear to be a capitalization of monopoly earnings or of special privileges. These are becoming greater and greater in value with the growth of every community. The monopoly prices charged make the franchise value, but the companies claim that the price cannot be reduced, because such action would reduce the value of the special privileges produced by those very high prices.

Companies claim that they have the right to earn from 6 per cent. to 10 per cent. on all these elements, and insist that anything less

than 10 per cent. on a value, that would include all of the above items save possibly franchises, is the least that the courts should allow. A member of this Committee of Twenty-one, Mr. Walton Clark, on April 30, 1906, stated in a deposition in the New York Consolidated Gas case, "as a result of my experience, it is my opinion that a rate should not be fixed which will necessitate a lower return than 10 per cent. upon the investment in new gas works in New York City," while a well-known member of the Commission which created this Committee of Twenty-one, Mr. Alexander C. Humphreys, stated under oath in the same case that, as a result of extended experience, he has found that many gas companies, both in this country and abroad, pay dividends of 10 per cent. and more. On the other hand, as this investigation shows, municipal plants have to pay only about 3 per cent. in Great Britain, and 4 per cent. in the United States, for the actual capital borrowed, and this capital does not include the increased value of land with the age of the works, nor the increased cost of material and labor since the plant was built, nor the paving put over the mains and services at the expense of the city, which is not an expense due to the pipes or wires buried underneath. Likewise, the municipal plants do not have to pay any 5 per cent. to 10 per cent. return on the value of the business or connections established with consumers and paid for once out of the operating expenses of the business, nor do they have to pay any interest on their rights in the streets.

Furthermore, municipal undertakings earning any revenue in excess of operating expenses, depreciation and interest are accustomed in America to pay off their indebtedness therewith, and thereby relieve the customer in the future of even any interest charge. Where a municipal plant, therefore, has only to earn 4 per cent. on its original cost and nothing thereon after the plant has been paid for out of earnings, it is only possible for a private plant to earn the far larger returns mentioned above by either high charges or by vastly superior management. That such superior management has often prevailed, and still prevails, in many cities must be admitted, but that it everywhere prevails or will continue to exist in the majority of our cities is quite another question. Certain it is that as soon as our cities have as good business management as private companies they will show vastly better financial returns for the user and taxpayer, to say nothing of the higher civic spirit which successful municipal operation appears to develop.

Municipal ownership in the United States has not as yet had a fair trial except in the supply of water. Most of our larger cities have no right under the existing state laws and constitutions to own and operate street railways or to sell electric light and gas for commercial uses. Otherwise Detroit and many other of our important cities would long ago have directly provided for their citizens street railways and light and power for commercial and domestic uses.

The nature of the present investigation, valuable as it has been, has prevented a proper presentation of the reasons that have

so strongly developed the municipal ownership movement in America during the past few years. We have attempted to compare a few of the best known, although often not the most efficiently managed, municipal plants with the best private plants in the same section of country. This answered fairly well for Great Britain, as elsewhere pointed out. It has developed that even in Great Britain the municipal plants selected because of their general fame are not in most cases those furnishing electricity or gas at the lowest cost of operation or the lowest price among the municipal undertakings, while the private plants selected were at the head of the list of private plants in those respects. In the United States this method of comparing the best known municipal undertakings with the best private plants in the same section of country broke down at the very start by the early recognition of the impossibility of getting such data from similar private undertakings. No effort was therefore made to secure an appraisal of the private plants and to compare it with their outstanding stocks, bonds and other liabilities. We were universally assured that such an effort would be fruitless. If, however, it had been possible to accomplish this there is every reason to suppose that the financial superiority of municipal undertakings with regard to the high ratio of assets to liabilities, which is so conspicuous a fact in Great Britain, would have been found still more striking in the United States in the water and gas works and in the electric light plant of South Norwalk. This alone of the municipal electric light plants examined has any revenue from commercial uses with which to take care of depreciation and to pay for the plant.

Not only, however, was the American investigation deprived of the opportunity of making an appraisal of the private plants, but it was also deemed useless to have our accountants report upon the various methods of keeping accounts, the true operating expenses, etc. All that was attempted in the line of comparison was to study the general engineering features of certain public and private plants, their rates of charge, the character of service rendered, and general labor and political conditions. Even this limited study was further restricted by our inability to make any comparisons at all with some of the cities that had been selected; for example, it was planned to compare the excellent South Norwalk municipal lighting plant with the private plant at Geneva, New York, which was chosen because of its supposed similarity of conditions. It was also planned to compare the Allegheny municipal lighting plant with the private Pittsburgh plant, situated in the same environment and in the same political conditions. It was also planned to compare the Syracuse Water Works with those of Utica, which obtain their supply by gravity, as does Syracuse, and could therefore be compared with it. Both cities also meter most of their services, which still further would facilitate comparison, but in all these cases the private companies failed to respond favorably to our request.

pairs and full allowance for depreciation and interest, was $2.41 per meter. House consumers who had meters in 1906 paid $198,746 less, which was 40 per cent. less, than if they had continued to pay the assessment, or flat rates, instead of getting the benefit of the meters which the water department bought, set and maintains entirely at its expense. This voluntary reduction by the city in its rates to domestic consumers, though the previous flat rates were lower than those of any private water company, would hardly have occurred under private ownership.

Where the business is an absolute monopoly, as in the case of the Post Office or the supply of water or street railway transportation, there is much to be said in favor of the common American practice under public ownership of charging the same prices both by wholesale and retail. For example, it is cheaper for the Post Office to sell 10,000 stamps at a time to one person than to sell a single stamp to each of 10,000 persons, yet the government charges the same price to every one. Many street railways, also, do not furnish tickets with any reduction to those buying to any large amount, and many municipal water works believe that it is in the interest of health and civilization to supply water at the same price per 1,000 gallons to the poor as to the large users, even though it costs more per 1,000 gallons in reading meters, collecting bills, etc., in the case of the small than of the large user. Private companies, guided solely by the question of revenue, do not do this, which is another evidence of the superior public service of municipal management.

The beauty of the meter system is that while voluntarily giving this great reduction to the consumer, the department has recovered most of it in the reduction in operating expenses which have been in large measure connected with the meter system during the last five years. The expenses of the department, including ordinary repairs, increased 60 per cent. from 1888 to 1894, and 62 per cent. from 1894 to 1900, but with approximately a corresponding increase of consumers and of business in the city the operating expenses and ordinary repairs increased only 12 per cent. from 1900 to 1906. If the increase had been 61 per cent. it would have been $136,000 more than was actually incurred.

Furthermore, the expenditure of $800,000 for meters has saved the expenditure of $1,600,000 in pumping machinery, mains, etc., and 7 per cent. on that saving of $800,000 brings up the total saving to the department to $190,000, or almost as much as the reduction in rates. The low rate has helped to popularize the meters and has led to the reduction in the amount of water from 169 gallons per day per capita in 1901 to 123 gallons, without any allowance for slip, in 1906, yet Cleveland has more water for manufacturing and business purposes per capita than have most cities.

FINANCIAL RESULTS.

In spite of the great reductions in rates in Syracuse on going from private to municipal ownership, and the phenomenally low

charges for all residence consumers under the present meter system in Cleveland and the moderate charges also in Chicago, the financial results of municipal ownership, from the standpoint of the community and the tax payer, are far better in the three cities above named than in the case of the two private companies studied. The private company at Indianapolis went through bankruptcy in 1881, and was bought out by the present company for less than one-half of its $1,100,000 of obligations (Volume II., pp. 9-10), but now with $500,000 of stock, that company is charging enough to pay 5 per cent. on its $3,200,000 of bonds, while the New Haven Water Company was paying at the time of the investigation 8 per cent. on $2,500,000 of stock and 4 per cent. on $500,000 of debentures, convertible in a short time into the stock. The people of Indianapolis are thus paying over $160,000 a year, and the people of New Haven $220,000 a year return on capital. It may not be fair to compare Syracuse with these places, because it has an exclusively gravity system with no pumping expenses. Cleveland, however, with its expensive tunnels and over three times the miles of mains of New Haven and over twice that of Indianapolis, and with four times the services or taps possessed by either of the above companies, had a bonded indebtedness at the close of 1905 of only $4,266,000, on nearly all of which the interest charge was only 4 per cent. The total burden, therefore, of capital charges was only $171,200, or about that of Indianapolis, and $50,000 less than New Haven. The capital charges and number of services in use were as follows:

City.	*Number services.*	*Interest and dividends.*	*Int. and div. per service.*
Syracuse	19,159	$133,057.02	$6.94
Cleveland	65,766	166,793.26	2.54
Chicago	235,000	105,431.64	0.47
New Haven.....	17,200	220,000.00	12.80
Indianapolis	16,910	160,000.00	9.46

Most of the property for which the city of Syracuse had to pay the private company $850,000 in 1892 had to be scrapped immediately. A large portion of the street mains consisted of cement pipes not strong enough for the higher pressures of the new water system and had to be displaced by cast-iron pipe. Another considerable portion of the mains consisted of iron pipe, which had to be replaced or supplemented because too small. All of the pumps, buildings and apparatus connected with the pumps were wholly useless for the new gravity system, and even the land was converted into a city park. (Schedule I). In view of all this, the financial management of the Syracuse plant has accumulated enough out of earnings to write off its depreciation and to have a plant to-day worth, according to Marwick & Mitchell and Mr. Maury, $500,378 more than the outstanding obligations of $4,080,-893.85.

The profits of all of the municipal plants are unduly reduced in the opinion of the undersigned sub-committee, by reason of the excessive depreciation alowed by our water works engineer for depreciation of the street mains and tunnels. He has assumed their average life to be only 50 years and then has reckoned the yearly depreciation at 1/50 of their value when new. He has included in their valuation the cost of paving, which in almost all cases has been put down over the mains since they were laid, and the expense of which was never borne by the water works and is no asset of that department. He then reckons depreciation on this paving the same as on the mains as an expense against the water department.

In Cleveland, whose conditions much resemble those of Chicago, a careful record has been kept of the yearly investment in the plant since its construction in 1855. It has been found that a yearly reduction of 2.2 per cent. on the net investment of the previous year, after depreciation had been taken off from that year, would reduce the total investment at the close of 1905 to a point within $50,000 of Mr. Maury's total valuation, even after deducting his appraisal of paving, while a yearly reduction of 2 per cent. would reduce the value to a point within $315,000 of his appraisal and $770,000 below an independent appraisal made by the engineers of the Cleveland Water Department. It is not fair, moreover, to deduct as much depreciation in 1905 as for the average of the previous 50 years. During 1905 the repair and renewal account was increased to $165,818 in order to cover part of the depreciation instead of remaining below $50,000, as it had been every year prior to 1904. In fact, the repair account had only exceeded $33,000 a year during three years in the entire history of the water works prior to 1904. Even 2.2 per cent., however, on Mr. Maury's valuations in 1905, aside from paving, would mean only $218,600 instead of $333,338, as estimated by Marwick & Mitchell in Schedule 4 on the basis of the engineers' estimate in Schedule 3. If due allowance be made for the extraordinary repair and renewal account in 1905, this $218,600 would become but little more than $100,000. Likewise, 2.2 per cent. on the present appraised value of the Chicago plant would reduce that depreciation from $775,848 to $656,365, while a 2 per cent. depreciation would amount to only $597,549.

The result of a recent electrolytic survey of every water main in Cleveland along the 100 miles and more of streets occupied by street railways has shown that the mains are positive to the rails and liable to suffer from electrolysis only in the 41 miles of mains nearest to the two power houses. This is but 6 per cent. of all of the mains. Conditions were not found to be bad even in those places, while the character of construction of the large pumps, boilers and buildings in which most of the pumping is now done would indicate that the life of the present pumping stations is likely to be as great as of the stations constructed 50 or 25 years ago.

It is impossible to make any fair comparisons of the operating costs per thousand or per million gallons of water pumped or deliv-

ered by gravity in different water systems, because of several reasons. The most important is that the very efficiency or enterprise of a department in checking waste directly diminishes the divisor used in computing the expenses per unit of water pumped and therefore proportionately increase its apparent cost per gallons pumped. Only when services are fully metered and where conditions in other respects, aside from management of the plant, are somewhat similar, can any very useful comparisons be made on the unit basis. Certain general conclusions, however, stand out very clearly in the data at hand.

The three municipal plants have accumulated a large surplus, as shown in the following table:

Place.	*Appraisal.*	*Surplus.*	*Net Liabilities.*	*% of net liabilities to present structural value.*
Syracuse	$4,493,715.14	$500,378.50	$3,993,336.91	88.9
Cleveland	10,930,264.74	6,941,137.92	3,989,126.82	36.5
Chicago	29,874,762.21	26,909,304.52	2,965,457.69	9.9

In other words, although Syracuse has only owned her works fifteen years she has paid off out of her earnings 11 per cent. of the value of her property, and taken care of depreciation. Cleveland, in her fifty years of public ownership, has paid for 63 per cent. of the present value of her plant, and Chicago has paid for 90 per cent.

In addition to this the city statistician of Chicago, Mr. Hugo S. Grosser, writes a member of the Committee (Bemis) that since 1896 the Water Department has turned over in cash for construction of the intercepting sewer $5,482,178.61, and for the sewerage pumping station $355,101.35, or a total of $5,837,279.96. It is suggested by Mr. Maury that the Chicago Water Department should have paid also from 80 to 90 per cent. of the $50,000,000 of cost of the drainage canal, and that the Cleveland Water Department should have paid a similar percentage of the $1,500,000 that has thus far been spent on the intercepting sewer.

Both of these projects were designed not only to secure a purer water supply, but also to insure a wholesome river and harbor. Further, the water department was in no way responsible for the contamination of the source of supply any more than a private company would have been.

If, however, the people of Chicago had seen fit to put upon the water department the entire expense of the drainage canal, the department could have stood the strain, but of course would have been obliged to raise the rates for water. In Cleveland this would not have been so serious a burden.

Since, however, the value of all land in Cleveland and Chicago has been enhanced by these harbor and river improvements much more than the cost of such improvements, it seems logical for their cost to be paid, as it has been, from general taxation or from bonds which are ultimately a burden on the general tax rate.

It is difficult, however, to understand how anyone could charge the city of Cleveland with a theoretical tax of over $20,000 on this intercepting sewer, since taxes upon sewage systems are practically unknown in America.

So far as the mere purification of the water for the use of the department was concerned, filtration would have been much cheaper in Chicago than the drainage canal, and would surely have been the choice of the water department if the cost had been put upon it, and if no other objects had been sought than the supply of pure water through the mains.

In face of all the extraordinary depreciation charges elsewhere considered and after allowing for all such taxes as it is estimated that a private company would have to pay, and after allowing for interest on indebtedness of these plants and such estimated rentals of offices, insurance and help of other departments as might be charged in the case of a private company, and for the value of the water furnished free, the three municipal water undertakings showed, according to Marwick & Mitchell, the following surplus from the operation of the year 1905:

Syracuse	$31,515.15
Cleveland	61,185.62
Chicago	1,681,512.14

CHARACTER AND EXTENT OF SERVICE.

Aside from the questions of pressure for fire hydrants and sanitation, the data at hand do not indicate any marked differences in either the character or extent of service or use between the private and municipal water works examined. The gallons of water per day per capita pumped or supplied by gravity afford no criterion of the relative use of water. In the absence of universal metering it is impossible to tell the amount of water that actually reaches the consumer in any American city. Even if that fact, however, were known, there are great differences in cities owing to the relative development of large water consuming factories and shops, the development of lawns and individual houses with many fixtures, etc. Even the number of services in use per thousand of population supplied does not tell a great deal. Syracuse has the most, and then come New Haven, Cleveland, Indianapolis and Chicago in the order named. The populations used as a divisor in Indianapolis and elsewhere are only those actually supplied other than from wells, but in a large city like Chicago far more families and business properties will use water from single connections or services than in most smaller cities.

More significant is the miles of mains per hundred miles of street, and the average size of such mains. From the report of Mr. Maury (Water Schedule III) with respect to the miles of mains and their average size, and from data obtained by the undersigned sub-committee from the city engineers of the cities in question with respect to miles of streets, the following table has been prepared:

EXTENT AND SIZE OF MAINS.

Place.	*Miles of Streets.*	*Miles of Mains.*	*Miles of Mains per 100 Miles of Street.*	*Ave'ge Diam. in Inches.*
Syracuse	250.00	179.31	71.7	10.15
Cleveland	645.70	647.48	100.3	9.42
Chicago	4,201.25[1]	2,020.49	52.5	8.38
New Haven	200.00	184.50	92.3	9.15
Indianapolis	448.35	270.95	60.5	8.34

This table shows that Chicago has the least development of mains per hundred miles of street, if the 2,716 miles of unimportant streets across the prairie are counted; but Indianapolis is next lowest and its mains are the smallest, while the New Haven plant is much better, but is inferior in mileage of mains per hundred miles of street to Cleveland, and is inferior in average size to Syracuse and Cleveland.

The lower rank of the private companies in fire protection comes out significantly in the following table based like the last upon Mr. Maury's report, and upon data furnished by the cities with respect to their miles of streets:

FIRE HYDRANTS.

Place.	*Number of Hydrants.*	*Hydrants per Mile of Main.*	*Hydrants per Mile of Street.*
Syracuse	2,809	15.6	11.2
Cleveland	7,642	11.8	11.8
Chicago	20,500	10.1	4.9
New Haven	992	5.4	5.0
Indianapolis	2,201	8.1	4.9

Neither Indianapolis nor New Haven has half the number of fire hydrants per mile of street or of main possessed by Syracuse and Cleveland.

In the matter of normal pressure, Syracuse leads, with 90 pounds, but Indianapolis, Cleveland and New Haven have satisfactory pressure, and only Chicago is weak. Cleveland had very low pressure in one section of the city for three hours in 1905, but has now so interlaced the mains as to prevent its recurrence, and is changing all its recording water pressure gauges to the automatic type. The pumpage capacity of Cleveland was increased 20,000,000 gallons daily in 1906, and a new pipe line is planned for Syracuse. All the plants studied, save Chicago, appear to have an adequate capacity. The reason for the high pressure in Indianapolis in case of fire is due to a contract with the city to furnish a great increase of pressure whenever the fire alarm is sounded, thus relieving the city to some extent of the need of fire engines. In return for this, however, and

[1] Only 1,485 miles are described by the city engineer as improved.

for many extensions of mains, the company is paid by the city $45 a year per fire hydrant. This multiplied into the number of hydrants in use in 1905 would yield $99,045, or $365.44 per mile of main. This is 4.6 per cent. of $7,944, which is $50 more than the entire estimated cost per mile of main of the Chicago mains, aside from the paving, as computed by Mr. Maury. These Chicago mains average a trifle larger than in Indianapolis and may have cost more to lay in the congested business section.

The Syracuse frontage tax of $15,639, or 5 cents per running foot of abutting property where there are no water consumers, is equivalent to only 1 per cent. of the estimated cost of all the mains, aside from paving. In most large cities, whether with private or public management, and where the water is supplied by pumpage, it is thought better to rely on fire engines, and in some cases upon a separate system of high pressure fire mains, such as have been installed the past winter in New York and Cleveland, rather than upon a sudden large increase of pressure as in Indianapolis. This is liable to burst the mains, as has sometimes occurred in Indianapolis.

The pressure in Chicago is certainly too low. Through a large expenditure for mains and pumps the last two years the pressure, as the undersigned sub-committee have been informed by the Chicago Water Department, is much improved in the districts where it was weakest during Mr. Maury's investigation. Further large improvements are under way in the nature of tunnels, pumps and mains.

The other mode of attacking the problem through the large development of metering and other methods of waste detection is also beginning to be taken up in earnest.

The way in which the population in Chicago has spread rapidly over a vast area has increased the difficulties. There is no reason to believe that the low pressure of Chicago is characteristic of municipal plants.

It appears from the report of Mr. Maury (Vol. II., pp. 281-8) that the fire insurance rates have been raised in two cities having private plants—Indianapolis and New Haven—and to a lesser degree in one of the public plants, on account of alleged deficiencies of the water department. The undersigned sub-committee, however, has been reliably informed that with the speedy completion of the high pressure fire lines in Cleveland the rate in that city is again to be lowered.

The engineer who constructed the new municipal plant for Syracuse, Mr. Wm. R. Hill, in a paper on the subject (Municipal Affairs, vol. 6. No. 4, page 733) made this remarkable statement:

"In the year 1897 the owners of the property in Syracuse were paying an aggregate of $600,000 per annum for fire insurance. But at once because of the excellent protection against fire afforded by their improved water system an average reduction of 25 per cent. was made in the rate charged for fire insurance, resulting in a saving of about $150,000 per annum, while the interest on the bonded debt of $4,000,000 —the combined cost of purchasing the water company's plant and installing the new water system—was but $137,500 per annum. Thus the value of a proper protection against fire is made apparent."

Sanitary Quality of the Water.

While a high typhoid death rate is not conclusive evidence of the bad quality of the water supply, yet a low typhoid death rate is absolute proof of the sanitary excellence of the water. Over nine-tenths of the people of any community do not boil the water they drink, so that a low typhoid death rate is the best test of the healthfulness of the water. The typhoid death rate per 100,000 is given for each of the cities studied, for 1905, in the Census Volume on Mortality Statistics, recently issued. The deaths for 1906 have been reported to the writer by the Board of Health of each city, while the population is the estimate of the United States Census Bureau. The following table gives the death rate from typhoid per 100,000 of the population in the five cities studied for the past two years:

TYPHOID DEATH RATE.

Date.	*New Haven.*	*Indianapolis.*	*Chicago.*	*Syracuse.*	*Cleveland.*
1905.....	42.8	30.2	16.5	17.1	14.9
1906.....	52.0	34.2	18.1	9.2	20.2
Averages..	47.4	32.2	17.3	13.2	17.6

The death rate in New Haven has been increasing since 1904, when it was 27.4. The three cities having municipal water works, it will be observed, have a death rate for the two years which averages only 16 per 100,000 population. There may be some explanation for this situation in the use of polluted wells in Indianapolis, but there is none in New Haven. The following table gives the rank as regards death rate of the five cities studied among the 38 cities that had the largest population in 1900. In no year was any municipal plant lower than the fifteenth in the list, while in no year was any private plant higher than twenty-third. The table follows:

RANK IN TYPHOID DEATH RATE OF THE FIVE CITIES STUDIED, BEGINNING WITH THE LOWEST.

Place.	*Rank in* 1905.	*Rank in* 1906.
Syracuse	9	3
Chicago	8	10
Cleveland	6	15
Indianapolis	23	24
New Haven	29	29

So few of the great mass of the people in Chicago and Cleveland bother to boil the water they drink that the high rank of those cities as regards the absence of typhoid must be primarily ascribed to the excellent sanitary quality of their water supply. The most eminent authority in this country on the purity of water supplies, Mr. Geo. C. Whipple, of New York, in his report to the city of Cleveland in 1905, while stating that filtration in his opinion would ultimately be necessary, said "to postpone a general filtration of the water a few years, however, is not likely to militate against the health of the city." (Report on the Quality of the Water Supply of Cleveland printed in the report of the Cleveland Water Department for 1905, appendix, page 9.)

There is no doubt that the supply at Indianapolis now furnished by the private company is much better than formerly and is free from criticism. The large death rate in Indianapolis is now chiefly due, according to our experts, to the persistence of the people in using their contaminated wells. If the city owned its water supply and enjoyed the more moderate charges for small consumers that prevail in most large municipal plants, public sentiment would surely sustain a much more rigid closing of the wells by the board of health than it does now. Such action, if taken at present, would lead many probably to suppose that its object was to swell the profits of the private monopoly.

The Chicago Board of Health makes daily tests of samples of water at its eight pumping stations. If a preliminary test indicates the possibility of contamination, the noon editions of the newspapers give an official announcement that the water from one of the more doubtful stations is "unsafe," and the people are advised to boil it.

During 1905, 17 per cent. of all the samples taken were thus pronounced unsafe. Thanks, however, to the progress on the intercepting sewers largely constructed from the revenues of the water works and taking the sewage into the drainage canal, the percentage of the 2,532 chemical analyses of city water that was pronounced unsafe in 1906 was only 0.5 per cent. The highest percentage was 1.3 per cent. at Hyde Park station, and the lowest was zero at Lake View and Springfield avenue stations. Only one station exceeded 0.7 per cent. In 109 cases where the chemical analyses aroused suspicion that the water might be bad a bacteriological examination was made. This proved that 92 per cent. of the 109 samples were safe. Only 8 per cent. or 9 samples during the entire year were found on bacteriological examination to be unsafe. This is a most surprising improvement over the conditions in 1905. The last contracts for intercepting sewers were let in 1906, and there is every reason to believe that henceforth the water supply of the city will be among the best in the United States. The data just given with respect to the water in 1906 were secured from the advance sheets of the report of the Department of Health for 1906 and from Mr. Hugo S. Grosser, city statistician.

CHARACTER OF PLANTS.

In this respect the municipal plants examined average better than do the private plants. The Syracuse plant is almost an ideal one, with a gravity supply. Mr. Maury writes of it:

"An unusual opportunity was offered to design and construct a large distributing system practically as a whole, for a city of 100,000 people. The engineer in charge made good use of this opportunity and the result is a well planned and constructed system of mains of an unusually large average diameter, well gridironed and equipped with more than the average number of gate-valves."

But of course Syracuse had this "opportunity" because of the utter and absolute failure of the private company to have an adequate system.

Owing to the lack of data on coal and labor costs it is impossible to compare the pumping stations at New Haven and Indianapolis with Cleveland, or with any one of the Chicago stations. The only comparisons our experts were able to make of a statistical nature were between Cleveland and Indianapolis. Measured by the customary engineering method of foot pounds or gallons of water raised one foot, the Indianapolis company does but one-fourth as much work with its pumps as Cleveland. Nevertheless Cleveland, in 1905, used only 54,542,100 pounds of coal, or 10 per cent. less than the 60,600,000 pounds used by the Indianapolis company, in order to accomplish four times as much work (Maury, Schedule III., Vol. II., pp. 298-300).

The new filtration plant at Indianapolis cannot be compared with municipal filtration plants, since several cities in Massachusetts and elsewhere having such were not studied by the Commission.

Those who imagine that municipal undertakings do not put in as large and up-to-date units of machinery and introduce as great labor-saving devices as do private plants, should visit the pumping stations of Chicago, Detroit, Cleveland and Boston, and many other of our largest cities. They will compare at any time with the best that private waterworks can show in any part of the world.

It is almost universally agreed among waterworks engineers that one great sign of progress is the development of the meter system. There are some who doubt the financial benefits resulting from metering all consumers, but few who doubt the wisdom of metering over 50 per cent. of the taps or services. In this respect, also, the municipal plants studied are far ahead of the private plants. Syracuse, in 1905, had metered 83 per cent. of her active services, Cleveland 68 per cent., since increased to 85 per cent., and Chicago 3 per cent., while New Haven had only metered 4 per cent. and Indianapolis 8 per cent.

Whatever defects may attach to the Chicago waterworks of to-day, Professor Gray has told us in Schedule I that the failure of the original private company to furnish an adequate supply and quality led to a petition by not only the city council and the mayor, but by

> "nearly all the citizens to the Legislature in 1851, to authorize a public water supply * * * The old company used wooden water pipes only, with an intake very near the shore, and furnished very poor water. Assuming that it had an exclusive franchise for the whole city for seventy years, it showed no inclination, with its single pumping station, to furnish either an adequate supply to meet the phenomenal growth of the city or water of a good quality, nor did the public agitation nor any other threats of competition cause them to show any signs of meeting the emergency in an adequate manner."

Syracuse, also, as well as Chicago, began municipal ownership because of the poor quality of water and the poor service and

high charges of the private company. After 50 years experience with the private company, Syracuse took over the works, January 1, 1892. Professor Gray states that the water was declared by the investigating committee of 1888 and 1889 to be

"suspicious in quality and uncertain in quantity. The company seemed wholly stupid and totally indifferent to the needs and desires of the people until the agitation for public ownership had gone too far to be opposed successfully. See the letter of the president of the company in the Syracuse Herald of March 23, 1885, in which he intimates that the company assumes no responsibility for the quality of the water, but considers that the city government, by originally approving the source of supply for the company, thereby entered into contract with the company to supply from that source. This is the same letter in which he set up the claim of an exclusive contract, and threatened to resort to the courts to maintain all of their contract rights * * * A threat such as this proved the indifference and self-sufficiency of the company and the hopelessness of an adequate water supply of good quality from that company. The highest courts of the state rejected every important claim of the company. * * * When it was too late the company woke up and offered to give an adequate supply of pure water. It never furnished wholesome water or water fit for boiler purposes; it never gave proper pressure for fire protection; it never carried water to any of the high levels of the city. The water was generally supplied to the low levels from a head of 110 feet."

Mr. Maury states that the average pressure in the lower parts of the city is now 90 pounds, which would be 208 feet, and he implies that the pressure is sufficient in all except the very highest parts of the city.

According to Professor Gray the company at the close of its life, January 1, 1892, had mains in only about 33 to 37 miles of street out of a total of 172 miles. The company supplied water in only 20 per cent. of the streets, and had only 387 fire hydrants, while fourteen years later under city ownership the plant furnished water to 179 miles out of 240 miles of street, or about 75 per cent. of the total. The city, now, according to Mr. Maury, has 2,909 fire hydrants.

The floor space for the offices, engineering and draughting departments at Cleveland are far greater in proportion to the population served than in the private plants examined, and Mr. Maury told the Committee of Twenty-one, when in Cleveland, that its statistical records and maps were the most complete he had ever seen.

In answer to question H 130 of Schedule III. (Vol. II., p. 267) as to whether the various plants examined, public and private, were in good condition, Mr. Maury replies "Yes" as to Cleveland and New Haven; as to Indianapolis, he says, "Yes, as a rule"; for Syracuse, "Generally speaking, the plant is in very good condition. most of it is comparatively new"; while for Chicago he says, "Most of it is in good condition."

Political Conditions.

Syracuse is the only one of the three municipal water works studied where the spoils system prevails. It is also significant that in Syracuse prior to the year of our investigation a majority of

the motormen and conductors got their places on the recommendation of mayors and councilmen. Syracuse, also, is the only one of the municipal water works where there is evidence of an undue number of employees, but that only related to some time in the past, for in that respect there has been much improvement in the last two or three years (Schedule 2, Vol. II, p. 155).

The general popularity and success of municipal ownership in Syracuse have doubtless been somewhat lessened, but not seriously impaired, by the spoils system. In Chicago and Cleveland there is practically none of the spoils system, and in Cleveland the head of the department has even greater power than in most of the British plants (Schedule 2, Volume II, pp. 141-2, 148-52). This Cleveland experiment, consciously borrowed from English examples which have been personally investigated by the mayor and the head of the water department, shows the possibility of profiting in America from the fruits of European experience. This is an apparently self-evident proposition, but one which some deny.

Professor Commons has discovered that in Indianapolis both the water and the street railway and lighting companies have recently contributed to campaign funds when local issues involving their interests were pending, and Professor Gray has reported that the New Haven Water Company, without apparently committing any illegal act, spent over $20,000 in molding public opinion and lobbying through the city government and the state legislature the contract of 1902 by which if the city buys the property, which it can only do at the end of any twenty-five years, it will also have to pay for the franchises.

Professor Gray states (Volume II, p. 135) "I regret exceedingly that I was refused a sight of the stenographic report" of a secret investigation by the City Attorney and the Assistant States Attorney and adds that the City Attorney

"did not deny that the company had spent large sums of money in creating public opinion favorable to the company and to this particular contract. He denied, and probably correctly, that there was any just ground for criminal prosecution.

"Having failed to prevent the passage of the contract by the City Council, and to bring about any prosecutions by the proper law officials, the opposition made a still more vigorous fight at the State capitol. They appeared before the Legislative Committee, demanding a legislative investigation of the contract, asking that action be deferred by the Legislature until after such investigation, reiterating all their charges, and furnishing their affidavits so far as the Legislative Committee would receive them. (The protestants seem, in fact, to have received scant justice at the hands of the Legislative Committees.) They claimed that their documents were never received, and that their opportunity to present the case orally was a farce because of the limited time allowed them.

"They then carried the matter to the Governor, presenting their evidence there, and the Governor sent for the Attorney-General, who sat with the Governor to hear the protests. They once more demanded a thorough investigation of the passage of the contract by the city, and a veto of the legislative act. All these requests were refused."

With reference to the general permanency of tenure of municipal water works officials, the only comprehensive investigation was that made by Mr. M. N. Baker, editor of the *Engineering News*,

as a result of his preparation of a statistical manual of water works. He finds that throughout the fifteen-year period ending in 1897, 23 per cent. of the municipal plants of this country, and 34 per cent. of the private plants, retained the same superintendent, and during the last ten years of the period 31 per cent. of the public and 39 per cent. of the private works did this. He found that in the New England States the public and private works made practically the same showing, and that a high one, during both periods. He thus concludes:

"Altogether, then, our American cities are to be congratulated on the permanency of the management of their water works; and the difference between private and public ownership in this respect is not so marked as opponents of public ownership and municipal reformers always have urged, although there is plenty of chance for improvement in each respect." (Municipal Engineering and Sanitation, by M. N. Baker, pp. 279-80.)

When considering the spoils system, also, in Syracuse one must bear in mind not only what Messrs. Commons and Sullivan have written of the pernicious and corrupting political activity of public service corporations other than water in that city in the recent past, but one must also recall Professor Gray's statement in Schedule I, that the private company in Syracuse, in attempting to prevent popular endorsement of municipal water works in the election of April, 1886, "is said to have spent $3,000 to carry this election." Three years later, however, the people voted 11,302 to 910, or 12 to 1, in favor of city ownership.

GAS WORKS IN THE UNITED STATES.

Municipal ownership of gas has never been tried on any considerable scale in America. Until a few years ago the only places that had attempted it were Philadelphia and a few towns and cities in Virginia and along the Ohio river, which would never have been picked out as notable for their good government and civic progress. Of late, municipal operation of gas works has been begun in many small towns and cities in the North and in Canada, where conditions are more promising and where good government along all lines is beginning to be appreciated. Whereas in 1890 there were only nine municipal gas plants in the United States, and only 15 in 1889, there are now 25 in the United States and 10 in Canada making coal or water gas, to say nothing of 84 small places selling acetylene, gasoline and natural gas. (A)

A.—Brown's Directory of American Gas Companies, dated 1907, and containing data for 1906, gives the following list of municipal gas works.

UNITED STATES.

	Feet Output.
Holyoke, Mass	136,970,000
Middleboro, Mass	1,874,600
Wakefield, Mass	25,000,000
Westfield, Mass	18,150,500
Norwich, Conn	40,000,000
Bellefontaine, O	40,000,000
Hamilton, O	73,000,000

Only four municipal plants, however, sell over 100,000,000 cubic feet and are thus of sufficient size to attract much attention. Of these four the best managed, Holyoke and Duluth, were not studied because the majority of the Committee of Five which made the selection held that they were not typical. Holyoke only purchased her plant six years ago, while Duluth, which purchased about the same time, has found it profitable to buy coke oven gas from a private company and simply does the distributing. Reference should be made, however, to the fact that Duluth, since buying out the private company in 1898, has reduced the price of gas from $1.90 for light and $1.00 for fuel to 75 cents for both and 50 cents for heating furnaces and gas engines, while the consumption has jumped from about 20,000,000

	Feet Output.	
Escanaba, Mich.	1,200,000	
Adams, Minn.	.....	
Duluth, Minn.	151,000,000	
W. Minneapolis, Minn.	1,594,450	
Dell Rapids, S. D.	1,838,000	
De Smet, S. D.	2,000,000	
Rich Hill, Mo.	3,000,000	
Gilroy, Cal.	4,000,000	
Alexandria, Va.	44,000,000	
Charlottesville, Va.	19,000,000	
Danville, Va.	42,000,000	
Fredericksburg, Va.	8,834,000	
Richmond, Va.	410,000,000	
Wheeling, W. Va.	116,000,000	
Cartersville, Ga.	6,300,000	
Dalton, Ga.	9,000,000	
Talladega, Ala.	5,000,000	
Henderson, Ky.	23,000,000	
Total		1,182,761,550
Number of plants	25	
Average size of 24 plants	49,281,731	

CANADA.

	Feet.	
Moncton, N. B.	4,500,000	
Sorel, Que.	4,000,000	
Belleville, Ont.	15,000,000	
Berlin, Ont.	25,000,000	
Brockville, Ont.	26,750,000	
Guelph, Ont.	30,000,000	
Kingston, Ont.	30,000,000	
Owen Sound, Ont.	16,000,000	
St. Thomas, Ont.	39,000,000	
Waterloo, Ont.	.....	
Total		190,250,000
Number of plants	10	
Average size of 9 plants	21,138,889	
Total sales of 33 plants in United States and Canada		1,373,011,550

The United Census Bulletin for 1900 gave 877 private gas works, and 15 municipal plants. Brown's Directory just quoted, gives about 1,300 private plants and 25 public gas plants to-day. Thus, the number of private plants has grown about 48 per cent., and the number of municipal plants, 67 per cent., in six years.

feet in 1898 to 151,400,000 feet in 1906. The operating expenses and interest are more than paid for by the earnings, but an extra 5 cents for depreciation could profitably be laid aside and probably will be set aside out of receipts from now on. (*)

Richmond, Va.

Richmond has had municipal ownership of its gas works since 1852, and during that time has vied with Atlanta, among all the cities of the South, in leadership in the reduction in price, while its expert accountants who have audited the books have reported that the plant has not only been paid for out of earnings, but has turned into the city treasury over $1,500,000 in addition.

It is therefore greatly to be regretted, from the standpoint of our investigation, that the city authorities would not permit a full investigation to be made by the Committee. The mayor, the chairman of the gas committee of the Upper House of the City Council and the superintendent of the works united in telling a member of the Committee, Mr. Bemis, that a recent investigation had been considered very unfair, and the people had been so worked up over it and over other suggestions for a lease that the question of the retention of the plant had largely entered into the election in the spring of 1906, and the council, with only one dissenting voice, voted to retain and improve the gas works. These officials stated that more of the profits had gone into the city treasury and less into improvements of the plant than desirable from the stand-

B.—The slow development of municipal gas works until lately as compared with the 1,000 municipal electric light plants appears to be due to three causes:

(1) The introduction of electricity as a mode of lighting and one fitted for streets and parks at a time when the municipal ownership movement was beginning to assume serious proportions in this country. The use of public funds or bonds for the establishment of a plant for lighting streets and public buildings was more favorably received than the establishment of a municipal gas plant, which until the introduction of Welsbach burners appeared to have lost its grip on street lighting. The argument against municipal gas on the ground that it might only supply private consumers was not sound, for whether the city as an organized political unit consumes any product or not, it is a representative of the entire public. In that capacity it is the only agent capable of dealing with a monopoly occupying its streets and necessarily dependent upon the city, county or state government for rights and privileges. Whether the city owns or only attempts to regulate, its responsibility is the same, and the question of how far streets are lighted by the undertaking is a minor matter.

(2) Gas companies had in many states perpetual or very long franchises or cities were unable to go into the gas business without paying to these companies, as in Massachusetts, the capitalization not only of their physical property, but of the value of their special privilege of being a monopoly in the streets, which they had obtained originally for nothing from the city. Electricity, however, being a new industry, and coming in at a time when the people were somewhat sensitive about long term grants, was more easily placed under municipal management.

(3) Gas was not as well fitted for small places as electric light because of the larger per capita expenditures necessary to distribute gas than electricity to a city or town of less than 10,000.

point of keeping the plant in first class shape, but even the thorough modernizing of the plant would not cost one-half as much as it has turned over in cash to the city during the last fifteen years. Improvements were at that time being voted by the council, but it was feared that if another investigation were entered upon, whose report would probably not be published for many months, this fact would be urged as an excuse for delaying these improvements and extensions until the appearance of the report.

Fortunately, before this decision was reached by the Richmond authorities our labor experts, Messrs. Sullivan and Commons, had made a study of the plant. They reported a good city government, comparatively free from the spoils system and from graft. They also reported that the workmen employed there were an excellent class of white labor, who were paid nearly twice as high wages as were the negro laborers in the gas works of Atlanta. (Schedule II, Vol. II, pp. 495-500.)

Philadelphia.

The Philadelphia gas works have been studied as almost the only instance of the abandonment of municipal operation of artificial gas works. This abandonment in Philadelphia in 1897 was not, however, in response to any popular demand. The city council voted down a proposition for a referendum vote, and an editorial in the *Progressive Age*, January 25, 1898—a technical gas journal never known to be friendly to municipal ownership—stated that "It was artificial pressure which effected the result," nevertheless the works were so badly managed under city control and so much better managed subsequently that the case is full of important lessons.

The plant was started with private capital in 1835, but administered from 1841 until 1887, by a self-perpetuating body of gas trustees, originally appointed by the city, then by direct city administration for eleven years until November, 1897, when a thirty-year lease was made with the United Gas Improvement Co. The irresponsible body of gas trustees, whose administration was in the later years honeycombed with politics and bad management, could not be ousted until certain bonds had been paid off out of earnings. When this was accomplished in 1887 and the city began direct operation, large improvements were made during the first three years, although the council only allowed the expenditure for that purpose of $581,312.58. The director of public works in his report for 1889 said, "With this sum the manufacturing capacity has been increased 7,000,000 cubic feet per day; the holder capacity 3,000,000 cubic feet; the new pipe laid amounts to 99½ miles, more than one-tenth as much as was laid during the preceding fifty years; the candle power of the gas has been increased 2.42 candles —nearly 14 per cent.; the cost of manufacture and distribution has been reduced from $1.40 per 1,000 feet, for the three months preceding the advent of the present administration, to 89 cents per 1,000 feet in 1889; and the number of men employed has been

reduced from 2,257 to 1,518." (Professor Rowe's Report, Vol. II, p. 636.)

Subsequent city councils, however, refused to appropriate the funds unceasingly demanded by the bureau of gas and the department of public works for improvement and extensions of the distributing system and of the works. Both the reports of Professor Rowe and of Mr. Walton Clark, of the U. G. I. Co., as revised by Mr. J. W. Sullivan (Schedule II, Vol. II, pp. 500-536), show that the U. G. I. Co. during the last eight years has far exceeded the period of city management in the following important respects:

1. The lodging of large powers in the hands of capable, well paid engineers.
2. Appreciation of the importance of keeping the plant in good repair and up-to-date in both the manufacturing and distribution system, and of the importance of adequate investment for this purpose.
3. Promotion, dismissal and general discipline of the force, if not its original selection, on the basis of merit.
4. Appreciation of the wisdom of the eight-hour day, regard for the comfort and safety of employees, and of co-operation in the study of new methods in the heads of all divisions.
5. Proper maps of the street system.
6. Adequate reports and checks upon the work of all employees.

Leakage and unaccounted for gas under city administration is said to have increased from 13.9 per cent. in 1887 to 29 per cent. in 1897 (Rowe, page 617). In all probability much of this so-called leakage meant merely that the meters through lack of attention were running slow, to the benefit of the consumer and the injury of the department.

Despite the unnecessary loss of fully $200,000 a year in the amount of unaccounted for gas by reason of insufficient attention to services and meters, and in spite of excessive costs by reason of the spoils system, inadequate and out-of-date machinery and poor management, the financial results of municipal ownership were better than commonly believed or those experienced by the City of New York with its far greater sales of gas per mile of main. Professor Rowe has shown that when direct municipal operation began, December 31, 1886, the plant had been entirely paid for out of profits with the exception of $1,802,948.22 (Vol. II, p. 591).

He also shows that after including the expenses of collection, maintenance of street lamps, etc., borne by other city departments, the net cash turned into the city treasury during the years 1888-1897 inclusive was $2,937,719.56 (page 629). To this should be added the amount spent for extensions of the works, mains and services, which is easily computed from Professor Rowe's data (pp. 607-32) at $4,344,316.92. This would make a total of apparent profit during the eleven years of municipal operation of $7,282,036.48. Since this profit was computed after including the operating expenses, and the expenditures for repairs of 8 cents

to 10 cents per 1,000 feet a year, the depreciation could not have eaten up any large part of this apparent profit. We may look at it in another way. The gas works paid over to the city during the eleven years nearly $3,000,000 in cash, after allowing for expenses incurred by other departments, maintained the street lamps, furnished free from 500,000,000 to 675,000,000 feet yearly for these lamps and for public buildings, and increased the plant out of earnings, as ascertained from the annual reports of the department, to the extent shown in the following table:

PLANT IN 1887 AND 1897.

Description.	1887.	*Dec.* 1897.	*Percentage of Increase.*
Mfg. capacity	8,800,000 ft.	20,300,000 ft.	130
Holder capacity	12,138,000 "	20,528,000 "	69
Services	129,788	217,438	67
Meters	117,746	172,976	47
Pipe over 6 in. in diam.	134.25 miles	169.03 miles	27
Total pipe	863.30 "	1,278.00 "	48

It will be observed that the large mains, whose life is probably a hundred years, were increased in mileage 27 per cent., the services 67 per cent., the meters 47 per cent., and the holders 69 per cent., while there was a still larger increase in the manufacturing capacity.

Although the plant was not in good condition in 1897, it appears to have been in as good condition as in 1887, so that a large value must be attached to these extensions out of earnings. The trouble was that while $4,000,000 out of earnings were going into extensions, councils did not put in from $4,000,000 to $8,000,000 more out of bond issues. Both the interest and the principal of the bonds would have been paid in a few years out of the increased earnings, to say nothing of the improvement in the service, and the general satisfaction that would have resulted.

The price of gas was reduced from $1.50 to $1.00 at the close of 1893. At first there were deficits, but these rapidly declined. According to Professor Rowe, there was a net profit during the eleven months of city operation in 1897, the last months of city operation, of $123,915.06, after paying expenses incurred on account of gas in other city departments (Vol. II, p. 631).

The report of the bureau of gas for 1897 (Annual Reports of Philadelphia, pages 77-8) shows gross profits for the eleven months of $382,646.12, but if from this be deducted the expenses of other city departments as given by Professor Rowe (p. 631), the result is only changed from Professor Rowe's figures so as to read $115,942.82.

Another result of municipal ownership in Philadelphia was the low price of gas. A comparison with the price in New York from 1845 to 1897, or fifty-three years, shows that during only eleven years—or one-fifth of the time, viz., 1865-7 and 1886-93

inclusive—was the price in New York lower than in Philadelphia, and allowance for the difference in cost of the higher candle power during part of the time of the gas produced in New York would still not equalize the prices. Much of the difference in candle power at the burner which often existed between New York and some sections of Philadelphia was due to local causes and did not apply to the whole city.

Finally, by reason of municipal ownership, Philadelphia was able to lease to the United Gas Improvement Company most valuable street mains, land and holders, to say nothing of such portions of its other plant as with moderate repairs could be put in good shape. By asking for no rental or taxes on this plant which had been paid for out of the profits of city ownership, Philadelphia was able to secure a lease under which it receives 10 cents per 1,000 feet of all gas sold to private consumers during the first ten years of the lease, 15 cents during the next five years beginning next January, 20 cents from January 1, 1913, to January 1, 1918, and 25 cents for the remaining ten years. The city also receives free of charge 700,000,000 feet of gas yearly for street lamps and public buildings, and the maintenance of those street lamps by the company.

On the other hand, in New York City during the past ten years, barring two years of the so-called gas war, 1899, 1900, the people have not only paid $1.00 as in Philadelphia, but they have also paid both for the gas used by the city and for the care and maintenance of the street lamps, while the taxes received by the city and state have not been as much per 1,000 feet as the payment of 10 cents in Philadelphia. Under the terms of the lease, also, the city of Philadelphia is supposed to receive the plant again in twenty more years with the large improvements required of the company meantime. That the city could have done still better, both in price and in profits with such management of its gas works as is bestowed upon the best managed water works in this country, such as Milwaukee, Detroit, Cleveland and many others that might be mentioned, or upon gas works that have been studied in Great Britain, is the belief of the undersigned. It is also believed that there are still weightier ethical and social reasons for municipal ownership. Nevertheless even the terms obtained under the lease are a sufficient justification of the ownership of the works by the city prior to 1897.

The report of Professor Rowe claims a candle power of over 19 at the works. This is considered to-day a good candle power by many of the best private companies here and abroad. Indeed, 18 candle power at the works and 16 to 17 candle power a mile distant is all that many private companies furnish. Through lack of services of sufficient size, however, of proper care for them and of sufficiently large feeder mains, the pressure in certain districts was low and the candle power was also affected. There continued to be improvement during the last year of city operation in the labor cost at the works. This expense fell from 31 cents per thou-

sand feet of coal gas made in 1887 to 20 cents in 1897 (Rowe, page 603). With proper management and proper equipment it should have fallen to less than 7 cents, and the total operating expenses and repairs should have been a half million dollars a year lower than they were. To accomplish this, however, required a liberal issue of bonds for improvements, as was yearly recommended by the gas officials. Professor Rowe shows that during the eleven years ending with 1897 the city put only $4,344,316.92, or an average of $394,937.90 a year into improvements, while the U. G. I. Co. in the eight years following 1897 has reported to the city an expense for extensions and improvements of $11,354,919,77, or an average of $1,419,358.72 yearly (Rowe, pp. 630, 649). The indifference of the councils to the need for improvements cannot be attributed to lack of borrowing powers on the part of the city, or of the unwillingness of the people to approve the loans, for only a week prior to the lease of the works in 1897, the people not only approved a bond issue of $1,000,000 for the gas works, but $11,300,000 for other public improvements. This would apparently indicate that the people would have approved a much larger issue than $1,000,000 for the improvements at the gas works had the matter been submitted to them. The explanation of the indifference, given by Professor Rowe, is so much in harmony with the statements made at the time by the Hon. Wayne MacVeigh and Mr. Clinton Rogers Woodruff, secretary of the National Municipal League (quoted verbatim in *Municipal Monopolies* edited by Bemis, pages 604-5) that a few extracts from Professor Rowe's report must be here given. He first calls attention to the fact that the tar contracts prior to the lease were awarded year after year to a local company composed of M. Ehret, Jr., George W. Elkins and George D. Widener, operating under the trade name of M. Ehret & Company, with only ten days' notice "so that it was practically impossible for any one but the former holders to be ready with proposals at the time the contracts were awarded" (Rowe, p. 616).

He next calls attention to the fact that the Philadelphia Gas Improvement Company, whose president was Mr. Elkins and secretary Mr. Widener, obtained a contract to supply water gas for the city in 1888, as the only bidder under an advertisement that gave but ten days' notice of the award of the contract (page 616). This contract specified that it should be on ground owned by the city and that "the ground of the city shall be surrendered and all buildings, machinery and appliances erected thereon and all materials shall be removed within 90 days from the termination of the contract unless they shall have been previously purchased by or forfeited to the city as hereinbefore provided." According to the contract the city reserved the right at any time to terminate the same absolutely or to purchase the plant at an appraised price. "Failure to furnish the gas contracted for in proper quantity or quality, no matter for what cause, shall forfeit the plant to the City of Philadelphia, whose officials may at once enter upon and take possession of the same." The director of the department of pub-

lic works was to be the sole judge of any default by the contractor. The Pennsylvania Senate Investigating Committee remarked upon these and other onerous conditions (Rowe, p. 623):

"It might well be supposed that no one would bid on such a proposal or undertake a contract which left its property absolutely at the mercy of the city unless, as appears to be the case in respect to other classes of contracts already noted, there was some sort of sympathy and connection between the proposed contract and the officers of the city. As a matter of fact, there was but one bidder, to wit: The Philadelphia Gas Improvement Company."

Professor Rowe next shows that (p. 627):

"Two of the presidents and one general manager of the electric light companies were members of the city council, and many other prominent men in local politics held positions in the various boards of directors. * * * Councils made insufficient appropriations for the gas works, but made generous contracts with private lighting companies. They appropriated the profits of the gas works to pay for the services performed by the favored corporations. The policy was, in a word, one of cutting off the producing power of the municipal plant at one end and increasing the competing power of its rivals at the other."

In this connection it should be said that while Mr. Walton Clark, the vice president of the United Gas Improvement Company and Mr. Sullivan, of the Commission, state that promotions and dismissals of the employees of the private gas company which are supplying water gas to the city were not controlled by councilmen yet "many of its employees, though by no means all, it is true, were obtained through the councilmen of the adjacent wards" (Schedule II, Vol. II, p. 508).

Mr. W. H. Gartley, formerly engineer of the Philadelphia Gas Improvement Company (Schedule II, Vol. II, pp. 520-2), in the same report of Messrs. Clark and Sullivan, made certain comments on the following extract when called to his attention from his testimony before the Pennsylvania Senate Investigating Committee. After stating that his company was "overrun with letters sent from councilmen," the testimony continued:

"There is a certain class of men up there we do not pretend to give steady work to. We tell a man that we will give him work as we have for three months, and after that he gets out whether he is a good man or a bad man. That is not done for anything except to be fair to all, and to give all something to do. If you give that class of men three months' work it helps the man along, and he can work his credit along for a while. Q. In that way you oblige as many councilmen as you can? A. In that way we oblige as many men as we can. We oblige them as often as we can."

Mr. Gartley embodies in Mr. Clark's report the statement that he believes this quotation is a summary, rather than exact quotation and "is the truth, but not the whole truth." Mr. Gartley, however, does not deny any of the statements in the testimony just given, and Mr. Bemis, who was present when this testimony was given and took notes of it at the time, has always distinctly remembered these remarks. Mr. Gartley now goes on to state that there were many men out of work in Philadelphia and "that his company gave the men three months' work at a time," and he adds, "there were two classes of men who far more than

any others used their energies in helping these men find work, councilmen and priests. Our list was filled largely through their efforts, and I specifically deny having given or having been instructed to give by my superior officers any special favors to councilmanic applications." From this and other passages in the present statement of the company it would appear that it did not allow the discipline of its employees to be interfered with by the councilmen, but that some of the latter came naturally under obligations to the company for the appointment of those whom they recommended. It is to be noticed that this testimony of Mr. Gartley was given two years before the lease and while the U. G. I. was selling water gas to the municipal plant.

As illustrative of Philadelphia conditions at that time, one of the undersigned sub-committee has it from the lips of a then prominent professor of the University of Pennsylvania that a company desirous of leasing the water works offered him $10,000 if he would agree to keep silent while the deal was put through the Councils.

Whatever may be thought of the claim of all advocates of municipal ownership that the council was influenced to keep the works in poor condition and to lease them by considerations other than those of the public welfare, few will dispute that already during the first ten years of the lease, one of the worst tendencies of the lease system and of private franchises has developed. Reference is made to the temptation upon councils not elected upon the issue to suddenly abandon an existing franchise or contract, with the consent of the other side and make a new one extending the grant. Upon this Professor Rowe has reported (Vol. II, pp. 651-2):

"The gas service since the beginning of the lease has been such as fully to satisfy the demands of public opinion. Even the most prejudiced critic must agree that the officials of the United Gas Improvement Company have done everything in their power to improve the service in every respect. Complaints are given prompt attention and adjusted in a spirit of fairness. In encouraging the use of gas for cooking purposes the company has performed a real service. It is not likely that there would have been the slightest agitation for the termination of the lease in 1908 had it not been for the unfortunate proposition submitted by the company in May, 1905, for the further extension of the lease until the 31st of December, 1977. It is not within the province of this paper to discuss the details of this proposal nor the influences back of it. To what extent the heads of the company were forced by unscrupulous politicians will probably never be disclosed. Suffice it to say that the proposition passed both branches of councils, and though vetoed by the mayor, would have been passed over his veto had there not been an upheaval of popular indignation which brought the city to the verge of riot and disorder. This incident has had a curious effect upon the public opinion of the community. It has developed a distrust of the influence of public service corporations on the civic life of the community. Whereas, prior to the recent agitation the people pointed with a certain local pride to the United Gas Improvement Company, there is now prevalent a keen sensitiveness to the dangerous political influences which such a corporation can exercise. Whether justified or not, the existence of this feeling is likely to have no inconsiderable influence on the future relation of the City of Philadelphia to the gas supply."

Wheeling.

Wheeling is the only municipal gas works that has been investigated fully. Two private gas plants, Norfolk and Atlanta, have also been studied with respect to the price charged, the character of service, labor and political conditions, but not with reference to the profits of the company, for the Committee was informed that the private companies in America would not give out information relative to their profits and capitalization. Atlanta was selected at a time when it was believed that full data could be secured from Richmond. Now that the latter has proved impracticable there is nothing with which to compare Atlanta. Comparisons, also, between Norfolk and Wheeling are of little value because of the enormous influence of natural gas in Wheeling, which has not affected Norfolk. Wheeling, however, is worthy of study by itself, because of its striking lessons for cities undertaking municipal operation, and because of its illustration of how even amidst as bad political and other environment as probably exists anywhere in America, municipal management may still be profitable to a community.

Professor Gray reports:

"The management is honeycombed with politics. Appointments in the gas department are parceled out and controlled by councilmen. All employees are supposed to belong to the party in power. Should that party change, it is probable that the whole force in the department would change. All employees are regularly assessed for campaign purposes. The following assessment for the last election is taken from the original assessment sheet of the executive committee of the Republican Campaign Committee:"

He then gives the assessment, ranging from $2 to $75 (Inquiry A 12, Gas). The discipline is reported as "indifferent," and the number of employees excessive (Schedule II, Vol. II, pp. 490-5; Schedule I, Vol. II, pp. 429-30). There is no responsible head possessed of engineering and executive ability and large powers.

The retorts should be replaced by those requiring less labor, and the pressure should be increased in a section south of Wheeling Creek, and on the island. There is evident need of repair and extension of the mains. To be sure, there were criticisms of the Atlanta plant as having need of larger mains in two districts, and in Norfolk there were numerous frozen services and inadequate holder capacity (Schedule III, Vol. II, pp. 552, 557), but matters were much worse at Wheeling. The plant was not even kept in a clean and neat condition. The leakage, as might be expected, was excessive, being 23 per cent. of the gas made as contrasted with 13 per cent. at Norfolk. In view of the moderate mileage of mains at Wheeling, the leakage should not have exceeded 8 per cent. By reason of the failure to build a switch track, the coal has to be hauled by carts at a cost of about 2 cents per 1,000 feet of gas made, to the profit of a private contractor. The labor cost of manufacturing is 24 cents per 1,000 feet, or over twice what it should be with modern equipment and a reasonable number of employees. Modern benches would also enable much more coke

to be sold per 1,000 feet of gas. No effort is made to push sales or increase the distribution system.

No financial corruption has been revealed or intimated, but in almost every other respect the plant seems to represent a union of all the abuses commonly charged against municipal plants, but rarely found united to such a degree in any one.

If, then, the only question between public and private ownership is the question of management, as erroneously asserted by many, one would expect the Wheeling experiment would be considered by its citizens as an unqualified failure. Such, however, is far from being the case. Professor Gray finds the "sentiment of the public and press generally favorable to public ownership; yet the belief is universal that the works are running down. Nearly every one says that he prefers this condition to the dangers of monopoly with a private company." (Schedule I, Vol. II, p. 429.) Despite its admitted defects, the Wheeling experiment has been a financial success. It has been the pioneer throughout the United States in low charges. The private company which preceded it had charged $3.50 per 1,000 feet from 1850 to 1859. "At that time indignation meetings were held throughout the city and large numbers of consumers entered into an agreement which they put into effect, to discontinue the use of gas" (Gray, Schedule I, Vol. II, p. 429). The net price was then reduced on prompt payment to $3.15, but the city bought the plant in 1870, and immediately reduced the net price to $2.52. The following table gives the net price in Wheeling and Norfolk since 1870:

TABLE XI—NET PRICE OF GAS.

Date.	*Wheeling.*	*Norfolk.*
1871.....	$2.52	$4.00
1872.....	2.52	3.60
1875.....	2.07	3.60
1876.....	2.07	3.20
1877.....	1.62	2.80
1879.....	1.08	2.50
1880.....	1.08	2.25
1881.....	1.08	2.00
1882.....	1.08	1.80
1883.....	.90	1.80
1887.....	.90	1.60
1888.....	.75	1.40
1896.....	.75	1.30
1899.....	.75	1.20 (illum.)
		1.00 (fuel)
1906.....	.75	1.00 (fuel & illum.)

It has been suggested that the meter prover at Wheeling was not accurate, and the meters might be fast. Mr. Burnett, one of our two engineering experts, writes to a member of the sub-committee, that he does not believe this claim is valid. He gives two reasons

for this, viz.: (1) The superintendent informed Mr. Burnett that before he tested any meters he stopped up all the leaks and made the prover tight. (2) The meters had not been tested for some time and 95 per cent. to 97 per cent. of all meters tend to run slow.

Wheeling had 75-cent gas in 1888, or many years before it was secured for any length of time elsewhere in the United States. Twelve years later, or in 1900, *Brown's Directory of American Gas Companies* reported only one place—Cincinnati—within several hundred miles of Wheeling that was securing artificial gas as low as 75 cents for ordinary consumers, and there are, according to the last issue of the *Directory*, only four such places to-day in all North America—Duluth and Wheeling, under municipal ownership, and the large cities of Cleveland and Cincinnati. This is not all. The report of the accountants, Messrs. Marwick & Mitchell, shows that for the thirty-four years ending with April 30, 1905, the plant has made a profit over and above all expenses of $823,600. Of this amount it has transferred to the city for general loan purposes $99,600, and has expended on account of the electric light plant since its erection in 1891 $362,800, less $68,200 directly appropriated by the city. The net amount that the plant has thus given the city for these two purposes out of its gross earnings has been $394,200. The rest of the money has gone into the plant. The municipal earnings of the gas works of Wheeling have thus paid for the plant, and have also turned into the city treasury $394,200 in cash.

The experts employed by the Committee differ as to the present value of the Wheeling plant. Messrs. Forstall and Burnett originally valued the property at $292,605 without paving, and $358,205 with the paving over the mains and services. This value was the estimated value that the plant would have for a "private corporation having the franchise in the town and desiring to utilize that plant for the manufacturing of gas, taking in the question of obsoleteness, and yet valuing the plant for what it is worth for gas making purposes" (Schedule III, Vol. II, p. 542). Later they were asked to ascertain what the value of the property would be if the private natural gas company received the permission which it does not now enjoy, of selling gas for illuminating purposes. One of the experts declined to answer this question on the ground of the uncertainty of life of the natural gas, which would vitally affect the problem. The other expert, Mr. Forstall, appraised the plant on the above assumption as:

Land	$50,000
Buildings	11,000
Apparatus at works	10,500
Consumers' meters	16,000
Total	$87,500

To this, however, should be added over $5,000 for miscellaneous supplies on hand, and $74,600 for street mains and services, to say nothing of the $65,500 of pavement over them. The above

values for mains and services took into full consideration their physical condition, obsoleteness, etc. Their value, if new, was stated at $105,600 (Schedule III, Vol. II, p. 542). The difference, of course, represents the cost of putting the mains again in good condition for use, and when placed in such condition, they could serve natural gas as well as artificial gas. This would at least be true of the mains, amounting to about $61,000. It is of course certain that if the city furnished the use of natural gas for light it would retail the same itself or sell or lease its distributing systems. Moreover, as a means of equalizing the pressure of natural gas, as a reserve in the case of a break in the supply main from the natural gas mills, the holders, whose present value is, for artificial gas purposes, $76,550, should not be wholly discarded. Whether, however, the value of the Wheeling plant to-day be taken at $358,000 as agreed upon by the experts, if the plant is to continue to manufacture and distribute artificial gas, or to be worth only $87,500 plus $5,000 for miscellaneous supplies if entirely shut down and scrapped, as claimed by one of the experts, it is certain that the plant has been paid for out of earnings and about $400,000 additional in cash have been turned over to the city out of the earnings of this plant whose prices have been far below that of private companies.

During the sixteen months closing with April 30, 1905, the plant, according to our accountants, made a nominal profit of about 13.5 cents, and a real profit of about 2 cents, even after charging in an allowance not paid by the plant for insurance, legal services, rental of the City Hall, taxes such as a private company would pay, and the estimated depreciation of the plant, etc. It may be added that it is somewhat unfair to charge as an expense against the plant a depreciation of $11,445 as was done in reaching the above figures without considering that if such an amount had actually been spent in repairs and renewals the operating expenses would have been thereby reduced. Credit should also be given to the city in addition to the other profits for the gas furnished free in the street lamps during the twenty years preceding the construction of the city electric light plant for street lighting in 1891. The plant is not obliged to earn interest because the cost was long ago paid for out of past earnings.

The average length of the services from the main to the meter is 41.3 feet (Vol. II, p. 541). Probably not over 20 feet of this on the average is between the curb and the meter. This part of the service is put in by the consumer, at a cost not exceeding 25 cents a foot, and probably not exceeding 20 cents. The cost at 25 cents would be $5. The cost of setting the meter probably would not exceed $2, making a total of $7. This would mean for the $4,000 services in Wheeling, $28,000.

The gas sold in Wheeling during the sixteen months ending with May 1, 1905, was 162,515,200 feet. The difference between the price charged at Wheeling, 75 cents, and at Norfolk and Atlanta, $1, or 25 cents multiplied by these sales, would be $40,628.80.

In other words, the saving to the consumer in the price of gas in less than one year will cover all the difference between the free services and the meter setting from the curb to the house in Atlanta and Norfolk and the cost of the same at Wheeling. These services at Wheeling since the work started were put in and paid for by the consumer years ago, and their cost is therefore an insignificant fraction of the saving that has been effected in the price of gas under municipal ownership.

The only criticism against the quality of the gas sent out from the plant is that some natural gas is mixed with it, but as only 5,000,000 feet of natural in a total of 218,456,000 feet or 2.3 per cent. was so mixed, the case is not serious. Some companies even pump a larger per cent. of air into their gas. Indeed, those who object to this slight mixture urge at the same time that all the gas supplied should be natural gas.

The city made a great mistake when it allowed a private company to introduce natural gas in 1885. The city should have bought the gas at the city limits and kept entire charge of its distribution. By this mistake the city has suffered instead of profiting, as it should, from the introduction of the new gas. While waiting to determine the probable life and legal rights of the latter company, the city hesitates to spend the money necessary to bring its artificial gas plant up to date. The city in its predicament allows the natural gas company to supply natural gas for illuminating as well as fuel purposes in streets where there are no artificial gas mains, but in other cases opposes, apparently without much vigor, the use of natural gas for illuminating purposes. In this respect the city copies the policy of many private gas companies who have opposed the invasion of their territory by natural gas and electricity. The introduction of natural gas even for fuel purposes in Cleveland, in 1902, was bitterly fought by the artificial gas companies. The true policy would have been for Wheeling to have taken the natural gas directly in 1885, or to have exercised at a later time the option which the original franchise gave for city purchase of the distributing system.

Not only does Wheeling show that even at its worst municipal ownership can bring large financial benefits to consumer and taxpayer, but it also shows that where the politics of a city are so demoralized as to give full reins to the spoils system in its municipal works, such a city is also likely to surrender itself, body and soul, to the private monopolies within its boundaries. Professor Commons has shown this clearly in his report. He shows that the two street car systems and the private telephone, electric light and natural gas companies united with the brewery interests in dominating the city council. The street car companies give leave of absence to their own men to do political work during the campaign, and pay "$10 or $12 on primary and election day for 'workers' who are not otherwise in their employ. * * * A large number of the motormen and conductors have secured their positions through the influence of councilmen, and many of them

were put on for the purpose of working for these councillors in primaries and elections. * * * There have never been but one or two notorious bribery cases in the council, and those pertained only to one of two casting votes needed for a franchise. Money is spent rather in the primaries and in the elections, although the councillors who are willing to accept them receive street car passes." Out of fourteen wage earners in the council, thirteen, according to Professor Commons, "are aided in their campaigns by the money of the corporate combinations referred to above, and six of them are in the employment of the capitalists interested in those corporations. * * * These same interests, again, projected a company and offered stock in influential quarters with the object of securing both the gas and water properties, but the extreme public opposition prevented consideration." In other words, both from the standpoint of finance and good citizenship, Wheeling, which comes far short of satisfactory results in ownership, makes a still worse botch of it when it comes to regulation. Private ownership of public service corporations in Wheeling seems to be partly responsible for the demoralized condition of the public service.

In closing this survey of municipal gas works of Philadelphia and Wheeling, which are typical of a certain type of municipal plants, fortunately more common in the past than at present, reference must be made to the fact that in the very extended study of municipal and private plants by the United States Department of Labor in 1899, reports were secured from 23 private gas works and 2 municipal gas works, Richmond and Wheeling, selling over 100,000,000 feet a year. One of these municipal plants was selling for $1.00, and the other for 75 cents, while only 3 of the 23 private plants even gave $1.00 net to ordinary consumers, and only 7 gave that, or a trifle lower, to large consumers. Only 3 out of the 23 gave to the very largest consumers rates at all approaching those given to every one for 19 years at Wheeling.

ELECTRIC LIGHT IN THE UNITED STATES.

Growth of Municipal Ownership.

Of the 574 municipal and private plants that were started prior to 1899 only 68, or 11.4 per cent., were municipal, while of the 1,502 central lighting stations during the next seven years, 318, or 21.2 per cent., were municipal, and of the 1,544 stations started during the following seven years, 1896-1902 inclusive, 429, or 27.8 per cent., were municipal. Of the entire 3,620 undertakings discovered by the Census Bureau, 815, or 22.5 per cent., were publicly owned and operated. The kilowatt hour output of the municipal stations, however, was only 7.8 per cent. of the total energy produced by all the stations, and the capacity of all the dynamos in the municipal plants was only 9.4 per cent. of the total.

Of all the municipal plants, 671, or 82.3 per cent., were in places under 5,000 population as compared with 72.8 per cent. of

the private plants, while only 23 municipal stations or 2.5 per cent of the total were in places of over 25,000, as contrasted with 5.4 per cent of the private plants. Such is the report of the United States Census Bureau for the years ending with June 30, 1902.

In view of the great advertising of failures of municipal electric light undertakings that is frequently seen in our newspapers, it is most important to observe that in 1902 the government found that only 13 stations that had been installed under municipal control were at that time being operated under private ownership. On the other hand, of the 815 municipal stations 179 began operation under private ownership. This means that for every electric light plant that had abandoned municipal ownership after trial, over 13 plants had gone in the opposite direction, from private to public management. This certainly speaks volumes as to the tendencies at work and the relative popularity and supposed success at least of municipal as contrasted with private management.

A list has recently been published of seventy alleged failures of municipal plants, the list beginning with Abington, Va., and ending with Xenia, O., and is a fair sample of such lists.

In response to letters from the writer to mayors or city clerks, thirty-nine of these places have answered. Three of the alleged failures, Anderson, Ind., Bowling Green and Toledo, O., were of natural gas and were due to the giving out of the supply—a difficulty which has always confronted many private companies. Three others, Gravesend, L. I., Fostoria, O., and Mayfield, Cal., never did operate a municipal lighting plant, and twelve others of those which have been reported as having abandoned municipal operation are, in fact, still operating their lighting undertakings. These are: Frankfort and Mohawk, N. Y.; Park Ridge, N. J.; New Berne, N. C.; Middletown, Pa.; Northeast, Pa.; Ashtabula, O.; Mason, Mich.; Monroe, Mich.; Springfield, Ill., and Herington, Kan.

There were other cities, also, where the cessation of city management was no indication of the comparative merits of municipal and private management. For example, a plant owned by the suburb of East Portland, Ore., was closed because of annexation to the larger city of Portland; and in Xenia, O., the private company which bought the municipal plant went into bankruptcy afterwards.

The latest governmental summary of municipal electric light plants is given by the Census Bureau for 1904 as Bulletin 50, issued in 1906, giving statistics of cities of over 30,000 population. In the thirty-nine cities having an estimated population of over 100,000 in 1904, only four—Chicago, Detroit, Allegheny and Columbus, Ohio—had municipal electric light plants, and these were confined to street lighting and public buildings. In the forty-five others having from 50,000 to 100,000 population, there were likewise but three municipal plants, and only one of these, Seattle, Wash., appears to do any commercial lighting. The others are Grand Rapids and Nashville.

In the next group comprising sixty-seven cities having a population of from 30,000 to 50,000, there were, according to the Census Bureau, eight municipal plants. Of this number, Holyoke and Taunton, Mass., Jacksonville, Fla., and Tacoma, Wash., do commercial lighting, and the other four, Lincoln, Neb., Galveston, Tex., Joplin, Mo., and Springfield, Ill., do not.

According to the Census Bureau, in the one hundred and fifty-one cities of the country of over 30,000 population there were in 1904 only fifteen municipal plants, and only five or six were doing commercial lighting. It is only when we come to the smaller cities below 30,000 that a large number of municipal undertakings are found. In the smaller cities there has probably been less prospect of profit for private companies, and therefore less opposition to municipal undertakings. It may be that in the smaller cities public sentiment in favor of municipal ownership may have been more easily organized and focused upon the city government. In the smaller places, also, the government may have been more fully trusted by the people and been more worthy of it than in most of the large cities. From whatever cause, however, the fact is clear that few of our large cities have undertaken municipal lighting and not more than one city of over 50,000 and none over 100,000 has attempted to furnish commercial light and power. This has been a serious and almost fatal handicap. The president of one of our large private lighting companies has remarked that no private company would venture to undertake street lighting unless it had always the opportunity to do a commercial business, and he did not see how a city could succeed in so doing. It is, indeed, a difficult task, for a plant lighting only streets and public buildings loses the great economies that come from a day load and from a larger use of the manufacturing plant and distribution system. Some of the larger cities which do their own street lighting, such as Detroit, have never received permission from the State Legislature to do commercial lighting. Chicago has only received that right within two years, and even now according to some legal authorities can only sell surplus electrical energy. The fact that smaller cities have usually not been so handicapped but have been allowed to do commercial lighting accounts, no doubt, in part for the large development of municipal ownership in such places.

A reason for the unusually rapid development of municipal ownership in the Central West has been the freedom there accorded to the smaller places in most states to go into municipal lighting without being obliged to buy out existing plants at a payment considerably in excess of structural value, as has been and is still necessary in Massachusetts and Connecticut and some other states.

The Central Station List and Buyers' Manual, published by the McGraw Publishing Company, New York City, March, 1907, gives some particulars about 1,055 municipal electric light plants distributed as follows:

(Volume II, p. 675). This is the more interesting because, according to the same expert, "there seems to have been a general dissatisfaction with the service supplied by the company" before municipal ownership began, in 1892-3. Professor Gray also writes:

"Although the present superintendent, Mr. A. E. Winchester, was originally chief promoter of the plant, the constructing engineer, and for nearly ten years one of the Commissioners—resigning July 1, 1902, and from four years previous to that date up to the present time superintendent of the plant—and although he takes a very active part in Republican politics and always has done so, I have not been able to find that political considerations have at any time had any influence in the promotion, disciplining or dismissing of any member of the force or with the operation of the plant. It ought also to be said that a large part of the success of the plant and of the enthusiasm with which it is regarded by the public are due to the personal activity and character of Mr. Winchester. His character in connection with the plant and his dominating influence over its fortunes are unique, so far as my observation goes. I understand that Mr. Winchester, in the early days, served the city in connection with the establishment and management of the electric plant without any salary at all, and in recent years has served as superintendent for a smaller compensation than he could command elsewhere. I believe also that every extension and enlargement of the works recommended by him have been speedily authorized by the city, and that in no case has the expense of the work exceeded his estimate as presented to the city meeting. In fact, he has also come well within every special appropriation made for investment, except one for $5,000 for meters, in which the original estimate was not exceeded" (Schedule I, Vol. II, pp. 667-8).

A similar tribute was unanimously given by a committee of five members of the city council that reported in September, 1902, with respect to the conditions of the plant. That committee had the expert assistance of Professor George F. Sever, of the Electrical Engineering Department of Columbia University.

The South Norwalk Electric Light Plant, like the Cleveland Water Works, represents the successful effort to introduce the idea of concentration and full responsibility, in the head of the department, which has been such a conspicuous cause of success in municipal work in Great Britain, and which should be thoroughly understood by those who think that the only way out of the spoils system in America is through a civil service commission. Some features of the latter, are excellent, but need to be supplemented by a realization of the necessity of full responsibility and power in an enthusiastic and expert head of a department if business efficiency and high morale are to be expected among the employees.

The rates charged at South Norwalk, of course, cannot be as low as in a large city, or where fuel is cheaper. Coal costs $3.18 per ton of 2,000 pounds, and fuel oil for a new Diesel engine costs 3.25 cents per gallon. In spite of these handicaps, the rates are lower than are charged by many of our large private plants for a similar class of users, although lower rates than those in South Norwalk are often granted by private companies to those who use much more electricity than any consumer in this city of perhaps 8,000 population to-day. The following table gives the net rates which are charged in cases of prompt payment, that is, after the 10 per cent. discount is allowed for bills paid within ten days:

MONTHLY NET RATES.

Lighting and Power Up to 1-5 Horse Power.

Kilowatt Hours Used.	*Net Charge Per Kilowatt Hours.*
First 100 kilowatt hours	9c
Next 200 kilowatt hours	7.2c
Over 300 kilowatt hours	5.4c
If over 1,000 kilowatt hours the rate on the entire bill is	5.4c
Power Over 1-5 Horse Power.	
First 200 kilowatt hours	4.5c
Next 400 kilowatt hours	3.6c
Over 600 kilowatt hours	2.7c

If a manufacturer should use 3,000 kilowatt hours per month he would pay according to the above schedule at the rate of only 2.94 cents per kilowatt hour. The minimum bill for mercantile buildings for power and light is $1.11 a month, less 10 per cent. for prompt payment, and for private houses, 55 cents, less the same 10 per cent. The city pays the plant in cash, as all cities should, for the public lighting. This is $60 per lamp per year for 109 arcs (5 amperes) of nominally 1,200 candle power and burning 2,883 hours. The hours vary each year with the number of dark nights, but were 2,808 in 1904, 2,883 in 1905, and 3,287 in 1906. The electrical energy developed at the station is equivalent to 83.5 kilowatt hours per year per capita of the population given in 1900, and probably nearly 70 kilowatt hours of the present population. Despite these low charges the plant is appraised by our experts at $87,242.45, or $830.19 more than the liabilities. Since the city only began to do commercial lighting in 1898-9, and has charged very low prices, its complete meeting of depreciation as well as interest charges is significant. The earnings of the plant, January 1, 1906-June 30, 1907, or since the period covered by our experts, have decreased the liabilities $17,000 and increased the nominal assets $3,400.

The accountants have reported that in addition to the operating expenses charged against the plant, there should be included $350 for water used, $968.50 for such taxes as a private company would pay, $130 for miscellaneous expenses, and $7,000 for estimated depreciation. Seven and one-half per cent. yearly depreciation charged on the yearly declining values after adding in the construction of each year is sufficient, however, to reduce the investment to its appraised value, but such a per cent. would require only about $5,000 depreciation charge instead of $7,000. All of the depreciation has been met out of the earnings, which were slight until commercial service was undertaken in 1888-9.

The plant is not allowed to sell electricity outside of the city limits. A private company has the exclusive rights save in the city itself. This is a restriction in our present laws in case of most of the municipal plants examined.

At South Norwalk, although every street is not wired, yet every applicant for electricity has been supplied. For a while the city sold electrical supplies, but finally decided it would be wiser to encourage the development of private enterprise in that direction, which it has lately done.

The plant was closed for half an hour in 1900 on account of a tornado, but the privately owned street railways were stopped for twenty-four hours, and in the neighboring city of Norwalk the electric light was also shut off for twenty-four hours, according to Mr. Winchester.

Not only does the city of South Norwalk have its own policemen and inspectors examining its lights up to 9 o'clock at night, but whenever any policeman reports trouble later in the night, an effort is made to remedy the same. Very much in contrast with the tendency of some private companies to frown upon complaints, the electric light plant has taken the novel step of issuing outage postal cards to citizens, and encourages them to use these cards in notices to the plant of any street lights that are found to be out.

It has been charged that South Norwalk has arc lamps producing a blue color and less light than the ordinary arc. This is denied by Winchester, who says that the Narragansett lamp is used.

The site of the plant is criticised, but with the use of oil for fuel, it does not pay to move.

Some have claimed that the 300 horse-power steam engine uses 60 pounds of steam per kilowatt hour, or double that of a modern efficient steam engine, but Winchester says only 30 pounds are used at the maximum.

The municipal plants, with the exception of South Norwalk, having no commercial lighting and power service, have not had occasion to make many scientific tests and experiments, but at South Norwalk the Stevens Institute students made special tests and studies in 1905.

It has been suggested that the voltage of this plant, which is that in common use in England, is not fitted for the recently invented lamps which require less current per unit of light than the old style lamps, but the superintendent of the South Norwalk plant, who at the same time is a member of this committee, and an expert employed by it, reports that he has quite different information from the manufacturers of these new lamps, and he expects to use the new lamps "within a reasonable time."

The net profit before paying interest, but after allowing the large depreciation charges of $7,000 suggested by Mr. Stebbins, one of our experts, was $6,735.96 in 1905, out of which it had to pay $2,991.67 of interest charges. This left a net surplus of $3,734.29. This was over 6 per cent. on the net bonds and notes outstanding at the end of the year. The plant had been all paid for out of these bonds and notes and out of earnings.

The receipts in 1906, according to the annual report of the department issued since our examination, increased 13 per cent. over the receipts of 1905, while operating costs and interest in-

creased only 5 per cent., and the business during the current year, 1907, is growing with even greater rapidity.

Detroit.

Next to South Norwalk the most successful municipal electric lighting plant examined has been that of Detroit. If it had been allowed to do a commercial business, its success would have been even greater than has been possible with only the lighting of streets and public buildings. The accountants and engineers speak well of the plant. Messrs. Marwick, Mitchell & Company write of the system of accounting: "Stated generally, the system is comprehensive and is satisfactory in detail, a storeroom account being kept and the distribution of expenses made under suitable headings." (Schedule IV, Q. I 17.) Professor Gray finds the sentiment "generally favorable" to the continuance of municipal ownership. (Schedule I, Vol. II, p. 673.)

When the city of Detroit decided to construct its municipal plant in 1893, the only proposition made to the city in place of a municipal plant was to accept the offer of the private company, which was $124.10 a year per arc light for three years, or $102.20 a year for ten years.

The Tenth Annual Report of the Detroit Lighting Commission for the year ending June 30, 1905, gave a cash cost of operation of $121,380.41, or $34.99 per arc light. To this the Commission added taxes that a private company would pay of $8,705 or $2.51 per arc light, and depreciation of $42,818.72, or $12.39 per arc, making a total cost aside from interest of $172,904.13. This amount annually apportioned to incandescent light and motor service in such portion as was represented by the kilowatt hours of electrical energy sent out for that purpose, left for arc lighting a cost aside from interest of $49.84. Our accountants held that the true cost of the above items, which included everything but interest, was $182,300.39, or only $9,396.26 more than the claim of the city. This is but 5.43 per cent. in excess of the report of the Commission, and would bring up the cost of arc lights, aside from interest, from $49.84 to $52.25. Four per cent. on the appraised value of the plant, $804,064.59, is $32,162.58. This interest charge divided between the arc and incandescent lighting, in proportion to output, will mean an interest charge per arc light of $9.28. This added to the $52.55 above makes $62.83 as a total cost per arc light on the basis of the claims of the accountants, but this seems to the writer much too high in the allowance for depreciation.

Our engineers agreed upon the percentage to be allowed for depreciation, but one of them, Mr. Stebbins, who wrote the letter on which the accountants made up their report, was mistaken in supposing that Mr. Phelps, the other expert, agreed with him in holding that this agreed upon percentage should be applied to the original cost of the plant. Mr. Phelps had intended that the percentage should be applied to the existing structural value, which was only 63¼ per cent. of the original cost, and would have made the depreciation $38,100 instead of $60,000.

A better way, however, of solving the question is to take the ten years' experience of the plant up to the time of its appraisal, June 30, 1905, and find what percentage it is necessary to write off annually from the yearly declining values in order to reach the present appraised value of $804,064.59, which represents the plant and other assets according to the joint report of Messrs. Phelps and Stebbins. The writer has discovered by computation that 2½ per cent. taken off from the original cost of $630,141.72 prior to June, 1896, and 5 per cent. yearly thereafter from the declining values and the annual new construction, would reduce the value June 30, 1905, to $799,520.79, or about $4,600 less than the net assets. This assumes no increase in the value of the land, although some increase has probably occurred. This 5 per cent. depreciation charge is therefore established on the firm basis of ten years' experience of this particular plant, as its rate of depreciation. Other plants built when prices were higher than in 1894-5, or with poorer judgment, may have depreciated more. The rate of depreciation at present is not considered by engineers in general to be greater than five or ten years ago. Power stations with turbines or large reciprocating engines and with closed alternating current arc lights have reached a point of efficiency where the annual depreciation is not likely to exceed the average of the past ten years. In fact, the depreciation, except in lamps, is likely to be less.

Applying this 5 per cent. rate, the depreciation for 1904-5 becomes $37,263, or almost the same as Mr. Phelps' estimate, instead of the $60,000 that had been assumed in the accountants' report on a misunderstanding, as above mentioned. This $22,737 excess of depreciation would, if taken off from the accountants' estimate as above given, of $182,300.39, reduce the expenses for operation, including depreciation, taxes, water and other omitted items, to $159,563.39, or $13,340.74 less than allowed in the official report of the Commission. The difference is chiefly due to the fact that the Commission did not deduct from the expenses, net receipts from rentals of poles and conduits, sale of old material, inspection work for the city and other work for other city departments, and allowed $5,555 too much that year for depreciation. This reduction in the assumed depreciation just mentioned of $22,737, would mean a reduction per arc of $6.55, if apportioned between arc and incandescent lighting in the proportion of the relative output. The accountants' report of operating expenses, therefore, of $52.55 would fall to $46, and their estimate of $62.83 as operation and interest charges, would fall to $55.28 per arc and 3.71c. per kwh. of station output for incandescent service.

The Eleventh Annual Report of the department for the year ending June 30, 1906, shows a further decrease of $4.95 below the costs of the previous year, so that the lights in Detroit are evidently now costing only about $50, with interest on the present structural value of the plant, and with full depreciation charges and allowance for lost taxes and other omitted items.

Comparison With Private Ownership.

It remains to compare the costs of construction and operation of the eleven years since the plant started with what the city would have had to pay for similar service from private companies somewhat in the way which our accountants worked it out in Chicago. Unfortunately, funds were not available to secure a similar study in Detroit and Allegheny, as was made at Chicago, but the writer has been able to do this in what follows. The accountants found the Detroit books in such good shape that there was nothing in their annual reports, it will be noted, which has been called in question, and the total operating and depreciation charges for 1905, as reported by the accountants, are even less than is given in the annual reports of the city, provided the annual depreciation charge be taken at 5 per cent. as the ten years' history of the plant prior to June, 1905, has shown should be done.

Up to June 30, 1906, Detroit had spent in construction and renewals $1,192,508.98, and in operation $1,196,607.22, and estimated its loss in taxes through public ownership as $86,385.19, or a total of $2,475,501.38. This is really too high, for the department has not credited itself with about $50,000 of net receipts from the sale of old material, work done for other departments, rental of poles and conduits, etc. The yearly compounding at 4 per cent., however, of the amounts entering into the above $2,475,501.38 results in a total maximum cost June 30, 1906, of $3,163,975.01. The Detroit plant and other assets connected therewith were appraised in June, 1905, at $804,064.49, and would be worth about $830,718.51 a year later after deducting 5 per cent. for depreciation and adding the construction of that year. Deducting this, the lighting of Detroit and the furnishing of incandescent lights for public buildings, etc., has cost approximately at compound interest, $2,333,155.19. A possible error of 5 per cent. in either direction would not be vital to the present discussion, but it is believed that the figures given above are substantially correct.

Over and against this must be placed the value of the arc and incandescent lights and motor service supplied by the plant since its start. The annual reports of the plants show the average number of arc lights in use each year and the total number of kilowatt hours of energy sent out from the station for incandescent lights and motor service.

Four comparisons have been instituted with respect to the value of the arc light service:

(1) The value on the basis of a ten-year bid made by the Detroit private company for $102.20 per arc light. This bid, if accepted, would have had seven more years to run when the municipal plant started. After that the prices prevailing in Cleveland have been taken.

(2) A second method was to take the Toledo prices per arc from the beginning of the municipal plant in Detroit.

(3) The Cleveland prices were then used for comparison.

(4) Finally, the Buffalo prices.

The following table gives the number of arc lights in use in Detroit and the prices used each year in the various comparisons just mentioned:—

COMPARATIVE PRICES OF ARC LIGHTS.

Year. (June 30th to June 30th.)	*Number of arcs.*	*Detroit[1] and Cleveland[2] prices.*	*Toledo.*	*Cleveland[2]*	*Buffalo.*
1895-6 ...	1298	$102.20	$90.00	$91.00	$117.75
1896-7 ...	1564	102.20	90.00	94.80	100.00
1897-8 ...	1744	102.20	90.00	94.02	100.00
1898-9 ...	1868	102.20	90.00	90.42	100.00
1899-1900.	1963	102.20	86.50	87.60	100.00
1900-1 ...	2035	102.20	83.00	85.26	75.00
1901-2 ...	2133	102.20	83.00	82.92	75.00
1902-3 ...	2386	78.96	83.00	78.96	75.00
1903-4 ...	2497	75.00	83.00	75.00	75.00
1904-5 ...	2818	74.28	64.00	74.28	75.00
1905-6 ...	3080	71.64	45.00	71.64	75.00

Not only, however, did the city of Detroit supply current for arc lighting, but incandescent lighting and a little motor service for many public buildings. At first this service was metered at the buildings, as well as at the station, and the loss in transmission was found to be 23½ per cent. During the last few years the meter service has not been extended, so that it is impossible to determine precisely the amount of loss. Owing, however, to the change in the character of current and the necessity of transformers, the loss has been computed by the writer at 40 per cent. during the last six years, and 25 per cent. during the previous five years. The managers of the plant insist that the average loss has not exceeded 30 per cent. Mr. Dow, while agreeing to the loss of only 23½ per cent. during the earlier history of the undertaking, holds that the present losses are fully 50 per cent. Probably the percentage taken by the writer, somewhat indeterminate between these two, is not far out of the way. It may be observed in passing that the lighting commissioners have been criticised for not metering all the public buildings, but state that since they are not paid for this service they would gain nothing directly by the expense of insulation and maintaining meters save to determine the amount of transmission losses.

It next becomes important to place the value per kilowatt on the units of electricity delivered at the incandescent lamp or motor. Nine cents has been taken for the first five years and seven cents thereafter. Among the reasons for this are the following: In

[1] Beginning with 1902-3 the prices are those charged in Cleveland because there are no Detroit prices that can be used as a guide.

[2] The Cleveland contracts are for calendar years, but the figures used in the table in order to correspond with the Detroit fiscal year are always an average of two years.

1894 the city was offered current at a net cost of 10c. per kilowatt, but the public schools were paying 13c. as late as 1902, and the county buildings in 1900 were paying 9c., but that year were offered an 8c. rate.

The manager of the private plant writes that "at no time during the last twelve years would a supply of current in a public building in Detroit have cost more than 10c. per kilowatt." He adds that special rates during the larger portion of the time could have been made for 8c., and under some circumstances, for 5c. or 6c. The county buildings and jail were paying 9c., however, until the city plant began to supply June 21, 1901, at 3¾c., and even in 1906 four schools and one engine house, according to the officials of the municipal undertaking, were paying 8c. It would therefore appear that 9c. for the first half of the period and 7c. thereafter was a conservative estimate.

The following table gives the approximate value of the light furnished in Detroit on the basis of what private companies would have charged in Detroit, Toledo, Cleveland and Buffalo. Correspondence with city officials in the latter three cities indicates that the prices just mentioned for incandescent light in Detroit were paid in Toledo and Buffalo on the average by the various public buildings which took their incandescent light from the large private plant of each respective city, while higher prices were paid in Cleveland.

DETROIT MUNICIPAL ELECTRIC LIGHT.

Basis of arc light prices.	*Arc lights.*	*Incandescent lighting.*	*Total.*
On Detroit 10-yr. bid for first 7 yrs. and Cleveland prices thereafter..	$2,533,746.69	$396,175.32	$2,929,922.01
On Cleveland prices for entire period.....	2,320,948.35	396,175.32	2,717,123.67
On Toledo prices.....	2,209,866.99	396,175.32	2,606,042.31
On Buffalo prices.....	2,409,217.19	396,175.32	2,805,392.51

We will now compare the above estimates of the present value of the lighting furnished, compounded at 4 per cent., with the cost of the service compounded in a similar way, less the present value of the plant, or $2,333,155.19, as above given. From this it appears that on the basis of Detroit prices the city has gained the difference between the latter figure and $2,929,922.01, or $596,766.82. Lest this be criticised as putting too much stress upon the bid of a private company for the first seven years of municipal operation, the comparison with Cleveland, nearer the coal fields and possessed, therefore, of cheaper fuel, shows a profit of $383,968.48 at the Detroit prices for incandescent lighting. The public buildings of Cleveland, even in 1905, however, were paying from 7.8c. to 12c. per kwh., therefore at least 15 per cent. should be added to Cleveland figures for such service, or $59,426.30, making a total saving to Detroit on that basis of $443,394.78.

As compared with Toledo, the profit in municipal ownership in Detroit on the above basis would be $272,882.81, and in Buffalo, $472,233.32. From all these estimates of profit about $100,000 should be deducted to represent the loss in taxes which Detroit has experienced through public ownership. This would make the balance of profit about $500,000 as compared with Detroit prices, $340,000 as compared with Cleveland, and $170,000 as compared with Toledo, and $370,000 as compared with Buffalo.

Another advantage which Detroit has secured from her municipal plant has been a great improvement in the service. Mr. Dow, of the Detroit private plant, thus expressed it in a paper before the National Electric Light Association in 1898: "The public was determined to have much cheaper lighting, yet when bids were asked for they were almost as far above a possible figure as the costs published by the theorists were below it. The only hope for the contractors was to secure the support of the more conservative elements by offering good light at a minimum rate. On their failure to do this, and do it quickly and gracefully, municipal ownership was as certain as the coming of summer."

The outages, *i. e.*, the number of hours that the lamps were out, were only one-twentieth as great during the first year of municipal ownership as during the latter years of private ownership, and the same low figure of outages has continued until the present time, although much larger than usual in 1905-6 owing to difficulties connected with the installation of a new turbine generator.

The only criticism of the plant, and that not clearly proven, has been that it was unduly conservative in replacing its open arcs and small generating units with enclosed arcs and larger generating units. Much progress, however, has in fact been made in this direction, and more is being made during the present year. In June, 1907, the open arc lamps were only 811, or one-fourth of the total of 3,601. To supply current for these 804 direct current arcs the plant has engine and dynamo capacity of 600 kwh., or 50 per cent. reserve, and to meet the incandescent demand of 400 kwh. and the alternating current arc demand of 1,385 kwh., the plant has 3,375 kwh. capacity, and is installing another large boiler.

Since the plant was started April 1, 1895, Detroit has had more arc lights in proportion to its population than many other cities. It possesses ten arc lights per thousand of population; Buffalo and Toledo have from eight to nine, and Cleveland less than four arc lights per thousand population. Reports were received by the writer from 26 of the largest cities of the country in August, 1907, and in the list of the six cities having over 10 arc lights per thousand population were included South Norwalk, Detroit and Allegheny.

A few have criticized the plant for reducing the amperes going to the lamps from 6.8 to 6.2, or about 9 per cent., on the enclosed arcs, and from 9.6 to 9.2, or about 4 per cent, on the open arcs, after 9:30 P. M.

The municipal plant has an excellent dock and gives its use free to the city. The dock, the only free one in the city, is in a central location, and is largely patronized.

Chicago.

The Chicago and Allegheny municipal lighting plants do not show as low operating expenses, the difference in the cost of coal being considered, as does Detroit, yet these plants are a remarkable confirmation of the wisdom of municipal ownership. They show that even in cities where political conditions are not of the best, and where good engineering is not fully observed in the construction of the plants, nevertheless municipal management may be justified. The reason is that cities that cannot construct and operate their own municipal undertakings to the best advantage are also likely to be so weak and inefficient in their dealings with powerful private monopolies in their streets as to have far less success in the regulation of the latter than in the management of the former.

Municipal ownership of electric light in Chicago started as it did in the case of water in that city and of many other municipal undertakings elsewhere because of dissatisfaction with private ownership. The critics of municipal plants, when they detect faults in public management, must bear in mind that the private management which preceded it and led to public ownership was often worse than what has followed. We are told in the report of our expert, prepared under the direction of Mr. Walter L. Fisher (Volume II, p. 666), that "the refusal of the private companies to take immediate steps to bury all their wires and the need of better illumination for the river were the causes that led to the establishment of the municipal plant" in 1887. In other words, the municipal plant was started because the private companies were not progressive enough to bury their wires and thus render the fighting of fires easier.

Another shock now comes to those who hold that private ownership stimulates progress. We are told by the expert just quoted that the opposition to the development of the municipal plant after 1887 was "strong on the part of the private lighting contractors, who did not want to see the gas and oil lamps superseded" (Volume II, p. 668). This would indicate that restrictions upon electrical development cannot always be laid to the door of municipal ownership.

The opposition of private ownership rendering it difficult to secure adequate financial appropriations is a fertile cause of trouble to many municipal undertakings. Let us quote from our expert on this point a little further. Speaking of the history of the plant for the few years following the beginning of municipal ownership under Mr. Barrett, city electrician, in 1887, it is stated:

"The machinery of the plant still consisted of small units, and, therefore, was not economical in management. Mr. Barrett, however, was not to blame. The appropriations under which he worked were not large enough to enable him to install large units. In fact, it might be said in general that the municipal electric lighting system has never

had money enough to be economical. It has been obliged to content itself with spending small sums on equipment when it was only by the expenditure of large sums that economical arrangements could be made. The difference between a private system backed up at its inception by large capital and this amateur municipal enterprise, handicapped by selfish opposition and by small funds, is extremely marked. Add to this the low salaries paid by the city and the sloppy methods of accounting, which even now are prevalent in the City Hall, and it is quite clear that apologists for the municipal lighting system will have several things to explain" (Schedule I, Vol. II, pp. 668-9).

While poor methods of accounting, however, have been a serious handicap to municipal ownership in America, the weakness has been by no means confined to municipal plants. In confirmation of this reference may be made to the annual address as president of the American Gas Light Association in 1899 of Alex. C. Humphreys, now head of Stevens Institute. His address, reported in full in the *Progressive Age* (Nov. 1, 1899), contained these remarkable words: "I am sorry to say that too often in my professional capacity I have discovered a startling condition in regard to gas companies' accounts, and so much has this matter been upon my mind in the last five years that I feel I should be distinctly at fault if I did not avail myself of this extraordinary occasion to give expression to a definite word of warning."

The municipal plant supplied 6,706 arc lamps on December 31, 1905, from its four generating stations. These lamps burn an average of 4,015 hours a year. (Schedule III, Q. H 66.) In 1905 this plant provided current for 23,058,267 lamp hours. This probably required an output of over 11,000,000 K. W. H., which was exceeded by only six municipal and four private undertakings in all Great Britain during the same year, even including those supplying power for general and for street railway uses.

The handicap, however, upon the Chicago plants through their legal inability to furnish commercial lighting, and thus secure a day load and a larger use of their manufacturing plant and extensive distribution system, prevents any fair comparison of Chicago with any municipal plant abroad or with any private undertaking in any country. The Illinois Legislature, by Act of May 18, 1905, has empowered the city to sell its surplus current henceforth for commercial use (Volume II, pp. 688-9), and the city has arranged for a large amount of power from the drainage canal at the low rate of $15 per year per horse-power for 11 hours a day (Schedule III, Q. H 131). The probability of making this arrangement has been an important reason for postponement of the substitution of larger and more economical units in the power stations, and of modern enclosed arc lamps for the 4,000 open arc lamps still in use. The securing of power from the drainage canal will greatly affect the plans for bringing up to date the more backward of the present stations. From the new H. N. May generating station 1,563 enclosed alternating lights were operated in 1906 at a cost of only $35.49, or $15.47 less than the average operating cost of the entire 6,692 lights. This is exclusive of depreciation, taxes and a few minor items.

The spoils system has been singularly kept out of the Chicago plant, as is well brought out in Schedule I. With this condition, but with the serious handicaps already referred to, the question has been raised whether the municipal undertaking could stand comparison with the up-to-date and enormous private lighting company of Chicago in the cost of street lighting. Fortunately such a comparison is possible, because it has been made for our Commission by Messrs. Marwick, Mitchell & Co. During every year of municipal management since 1889, the city has rented arc lights from the private companies on streets where its own wires had not been laid. Since 1894 the city has thus rented from 480 to 680 lamps a year.

From the two reports of our accountants, Messrs. Marwick, Mitchell & Co., the one for 1905, and the other the special report on the history of the plant, and from data directly obtained by the writer from the annual reports of the department, and from correspondence with the former chief, Edward B. Ellicott, and the present chief, William Carroll, the following facts appear:—

In the year 1905 the accountants report the true operating cost as $491,006.52, or $85.49 per arc, and $94.60 if interest be included on the structural value of the plant, but in making up this report, they included a theoretical charge of $100,000 for depreciation, and $59,640 estimated value of the water used. Subsequently, however, Mr. John Ericson, City Engineer, of Chicago, and Mr. William Carroll, head of the lighting department, carefully measured the water used during a portion of November, 1906, and from that discovered that the actual water used was approximately 556,188,000 gallons, or only about 40 per cent. of the 1,400,000,000 gallons that had been assumed. This at the rate then charged to large consumers would have been worth to the Water Department $25,887.12 instead of $59,640. Its cost to the Water Department was only $2.29 per 1,000,000 gallons, or $12,736.71. This included depreciation, but not interest. Since the Water Department, however, had paid for itself out of earnings, and had no interest, it is perhaps legitimate to exclude it.

An exhaustive study of the history of the Chicago plant by our accountants further developed the fact that the depreciation necessary to write off on the declining values from year to year to reach the present value, appraised by our engineering experts, was 7.39 per cent. This would mean a depreciation allowance for 1905 of $75,374.87 instead of the $100,000 arbitrarily assumed in the previous computation by the accountants and engineers. The total, then, of allowance for water and depreciation, should be $101,261.99 on the basis of the city rates for water, or $88,111.58 on the basis of the cost of the water. The former figure would reduce the operating cost per arc $10.17, and the latter figure would reduce it by $12.46.

Furthermore, the city of Chicago, in common with most other cities, has never carried any fire insurance, but has maintained the plant, including any damages that insurance would cover, out of

operating expenses, which have been taken into account by Marwick & Mitchell. Nevertheless, the latter compute an insurance of $4,481 or 78c. per arc in 1905. If this item also be deducted, the total net operating costs would be $74.56, if water be computed at the price charged to large consumers, or $72.25 if the water be computed at its cost to the department. These figures with the addition of interest would become $83.67 and $81.36, respectively, as compared with the $103 paid by the city for the lights that it rented from private companies that year.

Furthermore, one-third of the lamps belonging to the city plants were in the district where all wires are buried, and as will be shown later, there is good reason for believing that in that district the private companies would have charged much more than $103 for the lights.

COMPARISON WITH PRIVATE OWNERSHIP.

The special report of our accountants shows that the total cost of construction and of operation, including depreciation, was $5,551,061.44. The addition of 4 per cent. compound interest on the above costs from year to year on the assumption that the money was obtained from loans would bring up the total cost to $7,585,069.96. As a result of this expenditure, the city has not only had its lights since 1887, but it has a plant to-day whose appraised value at the close of 1905 was $1,315,707.18. To reach this figure, it was necessary to write off during the life of the plant $941,610.65 included in the above cost of construction and operation. This leaves the cost of the lights, $6,269,362.78, aside from the above $1,315,707.18 for plant. This includes allowance for taxes which it was assumed that a private company would pay, expenses borne by other city departments, and two items which are of a very questionable character, one of which was $45,461 for insurance. No such insurance was paid by the department, and any expenses incurred by explosion or fire were paid out of operating expenses. There is, therefore, good reason for ignoring this item.

The other doubtful item was the charge for water of $213,818.40. This would be reduced to $180,075.68 if the accountants had taken the estimate of the city as to the quantity of water used in 1905, as they did for the previous years. Apparently their only reason for not taking the city's estimate for 1905, based upon the measurements of the water used, was that before they had heard of the city's investigations they had made up their report for 1905 on the basis of the estimates of the engineers. If the city's estimates of the quantity of water used be taken at the cost of pumpage and delivery, including taxes and depreciation, but not interest, the charge for water would have been reduced to $79,576.57 for the entire period since 1887. On the basis, then, of the price charged for water and the city's estimate of the amount used, the total cost to the city of operation from 1887 to 1905, inclusive, with interest and depreciation charges added, would be $6,225,620.06; or, on basis of the cost of water to the water department, $6,125,120.95. If

the allowance for fire insurance be omitted, since it was not paid by the department, the net cost, even allowing for taxes, was only $6,180,159.06 with water at the price charged private consumers, or $6,079,659.95 if the water be reckoned at its cost to the water department.

Against this cost must be placed what it would have cost the department if its lights had been rented at the price charged by the large private companies in the city for the several hundred lights which they annually did rent to the city. It may be held by some that if the companies could have secured the contract for all the lights they would have charged less per light. On the other hand, it may be held with equal, or even greater, plausibility that had it not been for the competition of the city plant the charge for street lighting would have been even greater than it was. Where the private companies did not have to face city competition, but only such competition as individual plants in large buildings were able to develop, the average charge for all electricity sold, except for street railway use, was 10.26c. per kwh. in 1896 and 7.24c. in 1906. This is the actual statement of the representative of the electric light companies to the Committee on Gas, Oil and Electric Light of the Chicago City Council, February 27, 1906. Since about 2,000 kwh. are used in an arc light per year, this means that the average charge in 1896, or nine years after the municipal plant was started, was $205.20 per arc, and in the beginning of 1906, $144.80.

Under date of August 1, 1907, Mr. William Carroll, City Electrician of Chicago, wrote as follows:—

"Answering your letter of inquiry as to the commercial rates charged in this City for all night arc lamps, I submit the following:

During the year 1905 I was informed by some railroad officials that they were paying $125 per annum for aerial service similar to that furnished by the City.

The following is quoted from the Edison and Commonwealth schedules:

RATE SCHEDULE.

Contract for Arc Lamps.

The following prices for contract arc lamps are in effect from January 1, 1906, it being understood that these prices are for two-year contracts only.

350 watt low tension, dusk to daylight, 7 nights per week, $1.75 net per week.

575 watt low tension, dusk to daylight, $0.65 net per night.

450 watt, alt. dusk to daylight, 7 nights per week, $3.75 net per week.

350 watt constant current, dusk to daylight, $12 net per month.

I have no further data on this question at the present time."

The above four prices are equivalent per year to $91, $237, $195 and $144, respectively. The arc lights furnished by the city are fully 450 watt lamps, and correspond to the $195 lamps of the private company.

These are much higher figures than those charged by companies during the same time for arc lights supplied to the city, and therefore it seems safe to take the latter figures as a conserva-

tive estimate of what Chicago would have had to pay to private companies for its street lights if it had had no plant of its own.

The only difficulty in applying this method consists in the fact that only during the four years ending with 1898 did the private companies light any street lamps from underground conduits. In the rest of the city, where the wires did not have to be buried, the lights were supplied from overhead wires. During those four years, however, the companies, save possibly in Hyde Park, charged $137.50 for lamps from underground wires and only $105 for lamps from overhead wires.

Mr. William Carroll cannot find any exception even in Hyde Park when all the facts are understood.

Mr. Edward B. Ellicott, city electrician until three or four years ago, and now electrical engineer for the sanitary district of the drainage canal, informs the writer "that we discontinued renting lights on underground circuits, if I remember correctly, in 1899, solely on account of the fact that they would not reduce their prices for such service from $137.50 to $103. We afterwards obtained proposals two or three times in an attempt to secure lower prices for underground service, but never succeeded. Therefore it was proper for us to assume that all lights operated on underground service would have cost us $137.50 each."

Another reason assigned by our accountants for not separately computing the lights supplied by the city from underground wires at the high price charged by the private companies for such lights was that the vouchers did not indicate "whether the rented lamps were operated on overhead or underground circuits." The Electric Light Department, however, through its chief, Mr. William Carroll, writes the undersigned that the department has such records for every lamp although they may not have been on the vouchers. It therefore seems to the undersigned that the only correct way is to value the lights supplied by the city from overhead wires at the price charged by the private companies for the same, which had been $105 during 1896-8, inclusive, and $103 during 1899-1905, inclusive.

Likewise, it seems proper to value the lights supplied by the city from underground wires at the price at which the private company supplied them during 1894-8, inclusive, and at which it insisted on supplying them, if at all, during the subsequent years. On this basis the value of the lights if they had been rented, with interest compounded at 4 per cent., as in the case of direct city operation, was $6,823,154.73. *This cost, if there had been no municipal ownership, is* $642,995.67 *more than the cost to the city if the water supplied be valued at its cost to private consumers, and* $743,494.78 *more than the cost of the city lights if the water be valued at its cost to the water department.* In both cases no allowance is made for the $45,461 estimated cost of insurance, if the city had had any during that period, but that item, even if conceded, would not materially affect the result. A more significant evidence of the success of municipal ownership in a city which

is not famous for as good government as some could not be well imagined.

In a study of the labor conditions of the public and private plants in Chicago in 1901, Prof. John R. Commons, our expert on labor in the present investigation, found that the wages of the city electric plants ranged from 8.1 per cent. to 66.8 per cent. higher per hour than those paid by the private company, while the average wages were probably 35 to 45 per cent. higher, which meant that the total operating costs were 12 to 15 per cent. more than they would have been had the wages been the same as in the private plants. (Municipal Affairs, March, 1902, pages 109-10.)

This advantage of municipal ownership to the wage-earner has in considerable degree continued up to the present time. The study of labor conditions by Messrs. Sullivan and Commons in Schedule II (Vol. II, p. 146), shows that with substantially the same hours the private electric light companies of Chicago paid their firemen in 1905 from 25 to 31¼ cents an hour, while the city paid 36 cents. The private companies paid linemen 37½ cents an hour, while the city paid 42½ cents. The company paid to arc lamp trimmers 18 to 32½ cents an hour, while the city paid 36 cents. This will be considered by many an advantage of municipal ownership; others will take a different view. It is encouraging that the plant, however, in face of these high wages for an 8-hour day has yet been able to make several hundred thousand dollars profit during the past twenty years above depreciation, taxes and interest, in comparison with what private companies would have charged. This is, of course, on the assumption that the private companies, as above pointed out, had continued, as they doubtless would have done, to charge more for lights supplied from expensive underground conduits than from cheaper overhead construction.

The Edison and Commonwealth companies of Chicago, which are practically one, offered in 1906 to sell electricity to the city for $75 per year for each arc lamp supplied from overhead construction, but this was on condition that the city should grant important concessions in other directions. When these concessions were vetoed by Mayor Dunne, the best the city could get for arc lights supplied from overhead construction was $90 each per year.

Allegheny.

The Annual Report of the Municipal Lighting Department for the year studied, 1905, gives the operating expenses of Allegheny as $112,464.31. Our accountants, after making certain credits which the department should have given itself, and after allowing $3,000 for water used, $9,021 for taxes which it is assumed a private company would pay, and $1,800 for miscellaneous expenses, reached a total of $117,900.16 for all operating expenses save depreciation, or only 4.83 per cent. more than given in the Annual Report, which was $55.92 per arc. The total then becomes $58.62.

This estimate of our accountants includes an allowance for taxes greater than is reasonable by almost precisely this excess of $5,435.85.

In South Norwalk, Conn., the taxes were estimated at 1.1 per cent. of the physical assets; in Detroit 1.3 per cent., and in Chicago 1.36 per cent., or an average of 1.25 per cent. for the three cities, while in Allegheny they were estimated at 3.5 per cent. If the average of the other three places had been used, the taxes would have been taken at $3,481.63, or $5,539.37 less than the estimate used.

This mistake was apparently due to the fact that the plant had a so-called assessed valuation of $474,800. This appears to have been merely an estimate of the value of the plant by city officials based upon its cost of construction, and given to the public as among the assets of the city, which would encourage prospective buyers of city bonds. The application of the local tax rate of 1.9 per cent. on the structural value, $279,330.64, which was the conservative method followed in other cases, would have given a tax of $5,307.28, or $3,713.72 less than the estimate of our accountants.

It thus appears that the annual report of the department, by reason of its failure to give itself the benefit of certain credits, reported operating expenses almost as correctly in the total as if it had given itself this benefit, and at the same time had charged itself with water, taxes and certain omitted miscellaneous items. We might assume the same thing to be true in the previous history of the plant, but it would perhaps be more conservative to assume that the operating expenses in the previous years should be increased by 8.3 per cent. to cover omitted items, aside from depreciation, as would have been the case had it not been for certain omitted credits in 1905.

The accountants estimate the depreciation in 1905 at $30,000. This is based, as in the case of the other electric light plants, upon the letter of Mr. Stebbins reporting that he and the other expert engineer, Mr. Phelps, had agreed upon this amount. Had Mr. Phelps' position been understood it would have meant an allowance of only $18,780 for depreciation instead of $30,000.

A still better way of determining this question is to ascertain what percentage must be yearly written off from the declining values and annual new construction in order to write down the investment to the value as appraised by our experts at the close of 1905. Fortunately this is possible from the Annual Reports of the plant, which the writer has taken occasion to examine from the start.

The accountants found so little of error in the accounts for 1905, and practically none in the operating account, that it seems safe to take the official figures published by the Allegheny Department of Public Works since the plants were started July 7, 1890. A depreciation charge of 8 per cent. on these yearly declining values is sufficient to reduce the investment at the close of 1905 to $276,766.98, or $2,563.66 less than the appraised value. This 8 per cent. depreciation, or $11.77 per arc plus $117,900.16 operating expenses as above, means a total cost, save interest, of $70.40 per arc. and 3.41c. per kwh. of the station output for incandescent light and power.

COMPARISON WITH PRIVATE OWNERSHIP.

The total construction expenses of $582,659.96 up to March 1, 1907, compounded at 4 per cent., would amount at the end of February, 1907, to $891,963.04, and the operating expenses of $1,273,830.71 to $1,636,459.89, or a total of $2,528,422.93. An increase of the operating expenses by 8.3 per cent. to cover possible omissions of taxes, value of water used, etc., as suggested above, would bring up the total to $2,664,249.09. This is all the money that has been spent upon the plant or that was lost in taxes and in other omitted items. In return for this the department has a plant whose appraisal at the end of February, 1905, was $279,330.64, and upon which $52,735.23 was spent in construction during the next two years. This has been enough to equal the 8 per cent. depreciation each year as computed above. The undertaking has its lights, also, since 1890 to show for this expenditure. The arc lights were of the same character as those furnished by a private company in Pittsburgh. In the latter city the price paid by the city was $96 per light each year of the period except 1906-7, when it fell to $76. Applying this figure to the arc lights each year, and compounding the result at 4 per cent., yields as the probable price which Allegheny would have paid, $2,114,546.50.

With respect to the incandescent lighting, the city of Pittsburgh paid during the year 1905, and for four or five years previously, 9c. per kw. h., except in some school buildings, where the price was from 9c. to 12c. Doubtless prior to five years ago the price was still higher. It is therefore assumed that with a 30 per cent. loss in transmission 9c. per kw. h. should be allowed for the remainder of the current. This compounded at 4 per cent. would yield at the close of February, 1907, $1,024,768.17. This and the arc lights then would have cost the city of Allegheny on the basis of Pittsburgh prices, $3,139,314.67. The actual cost including the plant itself has just been found to be $2,664,249.09, or a cost aside from the existing value of the plant itself of about $2,385,000. The city of Allegheny then has profited by its experiment to the extent of the difference, or about $754,000. Of this amount about $279,000 is invested in the plant. The city has therefore paid for its plant out of earnings, and that means it has taken care of all depreciation, also, and has made about $475,000.

POLITICAL AND LABOR CONDITIONS.

Allegheny is the only municipal electric plant studied that has been in "politics."

In Chicago where the councilmen cannot put friends into the water and electric light departments of the city they find jobs for them with the private lighting and street railway companies. Very naive and characteristic of American conditions is the statement of one of the Chicago aldermen as reported in the following letter to a member of our committee by Mr. Geo. C. Sikes, secretary of the Chicago Municipal Voters' League (Schedule 2, Vol. II, pp. 142-3):

"In the last aldermanic campaign the Municipal Voters' League supported James D. Bowler as a candidate for alderman against Samuel O'Donnell. During the campaign I became well acquainted with Bowler. When the ordinance fixing rates to be charged by the Edison and Commonwealth companies was up for consideration during the present year, Alderman Bowler voted for the ordinance and also to pass it over the veto of Mayor Dunne. In discussing the matter with Alderman Bowler in the City Hall one day shortly after the attempt to pass the ordinance over the veto, Alderman Bowler in explanation of his vote said he wanted to vote for the ordinance if he could consistently do so because the company had rendered him important favors. He said the company had put seventy-five men to work for him since he had been elected alderman, and added that the demand for jobs was strong in the Nineteenth Ward, and an alderman had to do what he could to help his constituents. Alderman Bowler made this statement voluntarily and frankly, and in all innocence as if he regarded it—as he doubtless did—the proper thing for aldermen to get jobs for his constituents."

Can any one deny that under such circumstances the private lighting companies of Chicago are likely to exert a more demoralizing influence upon the council than the municipal electric light or water works?

In further confirmation of this, Mr. Fisher reports (Schedule I, Vol. II, p. 747) that in connection with the granting of electric light franchises in Chicago "there have been some scandals. The Cosmopolitan ordinance, for instance, was passed during the last days of the Hopkins administration (1895), and the circumstances surrounding its passage were so questionable that the succeeding council almost immediately repealed it. The repeal was invalid." With respect to the same subject in Detroit, Professor Gray writes: "The last great scandal was in the early days of 1893, when Mayor Pingree dramatically turned over the money in the council which he said had been paid to a member for his vote on the electric lighting contract. This furnished the immediate occasion for putting through the public electric lighting bill of 1893."

CONCLUSIONS.

It appears to the writer to be conclusively demonstrated from the above facts that in both water, gas and electricity the municipal plants have done far better for the taxpayer and consumer than the private plants in anything like a similar situation. Prices have been lowered and the plants have been largely or wholly paid for out of earnings, where there were any, or may be considered to have been mostly or entirely paid for out of the difference between the prices charged by private companies in the neighborhood, and the construction and operating costs of the municipal plants. In this method of computation all questions of depreciation are met. It is thus established that even where the management is no better and the freedom from political entanglements is no greater than in private plants, nevertheless the municipality has gained. This has been due to one of the great inherent advantages of municipal management, namely, the fact that all earnings above interest charges at 4 per cent., or thereabouts, on the original cost of construction, are available for reducing the capital charges and relieving the ulti-

mate burden of such charges upon future consumers or patrons, or the earnings may be in part devoted to free public service, as in the case of many water departments. It has been established beyond question that there is less typhoid in cities having municipal water works, which is a great benefit to the purity of the public water supply. The scope of this investigation has not led to a full development of the far larger public use of municipal than of private services, but such data as have been gathered indicate that there are more arc lights per 100,000 of population and far more use of incandescent lighting in public schools and other city buildings than where such services are furnished by a private company. In Detroit and Allegheny it has been easier to get appropriations for lighting the schools from the municipal plant than in securing appropriations to pay the prices charged for similar service by the private company.

Enough has been said about the political and labor conditions in the report of Prof. Commons, and in the references in the above chapters. It is believed, however, that the largest benefit of municipal management has come in the case of the majority of the municipal undertakings investigated through the freeing of the department from political evils, and in freeing the city from the desire of investors in the plant to secure a weak or corrupt city government. Where such good results have not followed, but where instead the spoils system has prevailed, it has appeared that the monopolies in private hands were equally enmeshed in politics. The general conclusions of the study of American conditions show that in our better governed cities there is greater superiority of municipal management over private management in neighboring places than is the case in Great Britain.

GAS AND ELECTRICITY.

MUNICIPAL AND PRIVATE MANAGEMENT OF IN GREAT BRITAIN.*

Growth of Municipal Operation.

Municipal operation of public utilities in Great Britain has passed the experimental stage. Half a century ago municipal water works were quite common, but there were few public gas works, and electricity and tramways had not yet appeared upon the scene. During these fifty years the extent of municipal activity has grown very greatly (as shown by Table 30), until at the present moment the municipalization of an undertaking calls forth no general comment. To appreciate fully the significance of the present situation, one should recall that nowhere in the world has more emphasis been placed upon private initiative than in Great Britain. No country has more continually and consistently opposed the extension of governmental activity, and yet Great Britain is second to none, unless it be Germany, in the extent to which municipalities are operating public utilities.

* The following discussion, from pages 185 to 260, was written by Milo R. Maltbie.

TABLE 30. EXTENT OF MUNICIPAL OPERATIONS.

	Municipal.	*Company.*	*Total.*
I.—Statutory gas undertakings, 1906.[1]			
(*a*) Number of undertakings	270	482	752
(*b*) Percentage of total.....	35.9	64.1	100.0
(*c*) Gas sold in M. cu. ft....	60,559,280	100,848,445	161,407,725
(*d*) Percentage of total.....	37.5	62.5	100.0
II.—Electric supply undertakings, 1905.[2]			
(*a*) Number reporting...	249	156	405
(*b*) Percentage of total.....	61.5	38.5	100.0
(*c*) Board of Trade units (k. w. h.) sold.....	364,511,692	169,082,623	533,594,315
(*d*) Percentage of total.....	68.3	31.7	100.0
III.—Tramway undertakings, 1906.[3]			
(*a*) Number owning lines in operation or being constructed[4]	175	137	312
(*b*) Percentage of total.....	56.1	43.9	100.0
(*c*) Route mileage owned and in operation.....	1,491.3	748.7	2,240.0
(*d*) Percentage of total.....	66.6	33.4	100.0
(*e*) Number operating lines..	90	96	186
(*f*) Percentage of total.....	48.4	51.6	100.0
(*g*) Route mileage operated..	1,276.3	963.7	2,240.0
(*h*) Percentage of total.....	57.0	43.0	100.0
(*i*) Route mileage owned by municipalities but leased to companies	,	215. or 9.6%.	

Reasons for Municipal Operation.

The reasons that have led to municipal operation are many. First, although not the most general nor the most important, there is the desire to secure for the public the financial profits of the undertakings. This was the principal factor in the municipalization of the Birmingham gas works. The council saw the large profits flowing into the pockets of the individual stockholders from an undertaking essentially public in its character; upon the other hand, it saw the development of the city hindered by the lack of funds, and argued that by taking over the gas works these large profits might be used for public purposes (see Schedule I, Gas, A 5-8).[5]

Second, there is the desire to keep the city from being mulcted by a private company. The early grants to the gas and water com-

[1] These statistics are from the *Returns relating to all Authorized Gas Undertakings* to the House of Commons, 1906.

[2] From Garcke's *Manual of Electrical Undertakings* for 1906.

[3] From *Return of Street and Road Tramways and Light Railways* to the House of Commons, 1906.

[4] Of this number, 22 municipalities and 41 companies had lines under construction that were not in operation.

[5] This reference is to the data in the Schedules in Part II, Vol. II, "A 5-8," and similar references are to the inquiries so designated. "Gas" means the Schedules upon Gas Works, which are four in number, but the inquiries are numbered consecutively through the whole series for any one utility.

panies were to run without limit and very few restrictions were imposed. Many companies became indifferent to the wishes of the people, and in order to get good service at a low figure, the towns were forced to propose municipalization. The companies, being very prosperous and subject to no effective governmental regulation of rates and service, refused to surrender their plants except at high figures. The prices demanded were virtually the capitalization of their profits, past and prospective, and in many cases were from two to three times the amount of money invested. Thus, the people had either to allow the companies to go on in their own way, however objectionable, or to pay them the capitalized value of their own exactions (see inquiries A 5-8, Gas).

The lesson was well learned in the fifties and sixties not only by the towns actually obliged to pay exorbitant prices but also by their neighbors who did not try to municipalize. Thus when tramway and electric lighting legislation was being framed, the cities naturally demanded that they be protected from such injustice and that they be given the right to acquire these undertakings after a period of years at the structural value of the physical property. This period was made 21 years for the tramways, which were then run (1870) by animal traction, and the same for electric lighting at first, but it was extended in 1888 to 42 years. Prior to the expiration of these periods, the tramway and electricity companies were in the same position as gas and water companies. Now 42 years is a long period for which to tie up a town, and many towns were not satisfied. They applied to the Board of Trade—a department of the central government at London—for powers to build and operate electricity supply works, and obtained them. Most towns proceeded to carry them out, but some of the smaller places, concluding that works could not be made to pay, have not built them. It is claimed that this policy has been very detrimental, but as the Board of Trade will not permit a local authority to hold its powers without action beyond a reasonable period, and will authorize a company to supply current if it applies for powers and the local authority does not act, much harm cannot be done, or the area would be given to a private company. However, it is clear that many towns have gone into electric lighting and possibly a few into tramways in order to protect the future. If they could have made a grant to a company and taken it back at any time upon moderate terms, many would likely not have decided upon municipal operation when they did.

It has been stated that the principal reason for the enactment of the restrictive legislation of 1882 was the desire of the municipalities to protect their gas works from the competition of electricity supplied by companies; but this statement is not supported by the facts. The movement for limited franchises antedated by many years the appearance of electricity, and was clearly due to the desire of the people to protect themselves from exorbitant demands based upon perpetual franchises.

A third factor in the movement for municipal operation has been the general demand for better service at lower rates. Complaints have sometimes been aimed principally at the high charges (e. g., Manchester tramways) and in other cases at the poor service rendered (e. g., Glasgow gas), but dissatisfaction with service or rates has probably been the cause of more municipal operation than any other factor. Private companies having monopolies tend to become indifferent to the kind of service rendered and to charge all the traffic will bear. In many instances the towns have tried to remedy conditions by regulation or control, leaving private management still in the field, and have adopted public operation only as a last resort. For example, Glasgow tried in every possible way to reach a fair and just arrangement with the private company operating its tramways two decades ago, and went into municipal operation only when forced to the conclusion that no plan which would safeguard the interests of its citizens would be accepted by the company. Indeed, the extent to which tramways have been municipalized throughout Great Britain is due largely to the attitude of the private company in Glasgow, for when Glasgow had shown how successful municipal operation might be, city after city followed its example (see A 5-8, Tramways).

There is a fourth cause which has played a prominent part in the United States, and is not unknown in Great Britain, although less common, viz.: opposition of the public utility companies to the public welfare of the city. An example of this was seen at Liverpool when the tramway company opposed the extension of the city boundaries and tried to prevent the development of the suburbs, until its demands were met. One of the principal complaints against the Glasgow tramway company was that it did not treat its employees properly or pay them sufficient wages to permit them to maintain a proper standard of living. A similar charge was made against the Manchester and London tramway companies. Corruption and bribery by companies is practically non-existent, and the harmful influences which so commonly debauch our municipal life, because of the predominant importance of public franchises, seem to have been reduced to a minimum in Great Britain. There are only such indirect results as the inferior character of councils where no public utilities are managed, the most able men being attracted to membership upon a committee which controls water works, gas works, electricity supply plants or tramways, but frequently kept out when companies control them. However, the fact that municipal operation does remove the temptation to exert improper influence upon city officials by private companies is recognized as one reason for municipalization. (See the minutes of the hearings before the Committee in London.)

A fifth factor has been the belief that municipal operation would permit the co-ordination of public services in a way that is not possible where different services are operated by companies. For example, it is universally admitted that public authorities should control the streets, but if water, gas, electricity supply and tramway companies are given authority to tear up the paving to

lay mains, pipes and wires, and to put down railway tracks, there is not only a division of responsibility, but there is also confusion, delay and interference with traffic. This argument is very strong in Great Britain and the statement is constantly made that public utilities should be operated by local authorities in order that they may retain full control over the streets.

Another example is to be found in the relation of tramways to the housing question. The plan which seems to promise greatest success, among the many suggested for the improvement of housing conditions, is suburban housing. Whether people will move from congested quarters to the suburbs depends very largely upon transportation facilities. It has been found easier to co-ordinate plans for improving housing and for improved transportation where both were in the hands of the same authority. This factor had greater influence in the municipalization of Manchester and Liverpool tramways (see A 5 to 8, Tramways) than anywhere else.

It should not be inferred that the present extent of municipal activity is due to any sudden movement or was brought about in one day. It is the result of gradual growth, each successive step being based upon previous experience. Municipal operation has generally been adopted only after a full trial of private management under various forms of regulation and control. In historical sequence there was first free and unregulated private operation. This soon proved wholly unsatisfactory and inimical to public welfare. Then various systems of public regulation were tried, the methods being perfected as defects were discovered and more effective devices evolved. In many instances, as shown by Table 30, even the best system of public supervision did not produce satisfactory results and municipal operation was adopted. Of course, all towns have not passed through every stage of this evolutionary process, but, profiting by the experience of others, many have jumped intermediary stages.

There are also hundreds of undertakings which have not been municipalized but continue in private hands. These companies have given results which are acceptable, and the people see nothing to be gained by municipalization, or the cost of the undertaking is so high as to make purchase too expensive. The question of municipal *vs.* private operation has not been treated as a doctrinaire question in Great Britain but one of social expediency. Under what form of management or control can the best results be obtained?—that is the question constantly asked, and little has been said about the natural or *a priori* method. Where municipal operation has been adopted, the reason is that private operation did not produce as good results or such results as the people believed could be secured by public operation. If company management has been adhered to, the explanation is not that private operation was believed to be natural or predestined.

Effect of Municipal Operation Upon Private Companies.

The fact that private operation has grown steadily better almost in direct proportion to the increasing efficiency of municipal

administration of public utilities, is most suggestive. Prior to the middle of the last century, British municipal government was notoriously corrupt and inefficient, and few utilities were publicly operated. Private companies were in the ascendancy; they were allowed to have their own way largely, and high prices and indifferent service were prevalent. In the fifties and sixties, the work of municipal regeneration was largely completed, and municipalization of public utilities had come to be recognized as feasible, frequently desirable and entirely practicable. This was also the period when water and gas rates very rapidly declined from their hitherto very high level, when service improved and when the efficiency of company management generally became better.[1] It is not asserted that these results were entirely due to the fear of municipal operation or the desire to prevent it, but it is true that the increasing efficiency of municipal government made municipal operation more successful and more desired by the people. This, in turn, spurred the companies on and compelled them to treat the public better, for so long as company management had as its only competitor company management (each company having for its object the same thing—financial profit, larger dividends), there was no alternative and the companies knew it. Municipal management was then so inefficient that private management could be very bad before a community would oust it. But when it came to be true that a municipality could run an undertaking with economy, financial success and satisfaction to the people, the fear of municipalization became much more real, and a new competitor entered the field—a competitor which could only be beaten by lower prices, improved service and more regard for public interests. Thus, as municipal operation spread and became more efficient, private operation was forced to improve.

Again, the fact that cities could operate public utilities did not mean that all tried, for often the power to operate was as effective as actual operation. It has been found in Great Britain that no system of control or regulation is complete without the power in the hands of the municipality to purchase and operate. If one company may be superseded only by another or only hedged about by restrictions, there come times when action, not repression, is wanted, and then no remedy is adequate unless it be the power of the city to step in and operate the undertaking itself. But the mere fact that it has the power often makes its exercise unnecessary, and what the Britisher desires is not the universal adoption of some method of producing results, but the results themselves.

In the following analysis of the results of public and private management it should be borne in mind that such a comparison is not a comparison of municipal with private operation subject to no restraining force, but with private operation under systems of

[1] A comparison of reductions in rates in the United States and Great Britain is sometimes made to show that rates have declined more in the last 30 years here than abroad, but the big decline came much earlier in Great Britain, due largely to the growth of municipal ownership.

regulation (for details see Schedule I) which are claimed to be the best which have yet been devised in Great Britain and with private management that has been chastened and bettered by the fear of public condemnation, by the restraint of government regulation and the possibility of municipalization. Thus the low price at which gas is supplied by the Sheffield company is largely the result of the avowed determination of the men in control to head off municipalization. If municipal operation had not been a possible alternative looming above the horizon, it is likely that even now the consumers would be paying very much higher rates; and the present low rates so far as they are due to the desire to prevent municipal operation should be counted as one of its indirect results.

Reliability of Information.

The following analysis is based principally upon the reports of the experts published in Part II, Volume II. Additional data upon special topics have been taken from government reports, documents and Blue Books, and from other authoritative publications. In each instance, reference is given to the original sources, so that the reader may investigate the subject for himself; indeed he is urged to do so, for this summary must of necessity be brief.

Oral communications, unsupported by written statements or documentary papers, have been considered too untrustworthy to be accepted as evidence. No attempt has been made to gloss over the defects of municipal operation or to select only such facts as show its successful features, although the writer is frank to confess that the evidence has convinced him that as a whole public operation of gas, electricity and trams in Great Britain has been successful. The writer has refrained from any reference to motives; it is unjust to insinuate in the absence of facts. No attempt has been made to deny the reports of the experts, or to insist that they must be wrong because they are contrary to current notions. Facts are facts.

The opponents of municipal operation, having failed to explain away the favorable results shown by the accounts of the municipal undertakings, as a last resort fall back upon the assertion that the accounts are "cooked," that expenditures which should be charged to the plants are paid out of other funds and that all deductions based upon the published accounts are therefore untrustworthy. The writer does not believe this charge is well founded, and the statements made in the reports of the accountants—Messrs. Turner and James—are accepted as accurate and reliable. This has been done in view of the following facts:

The accounts of each municipal and company undertaking were kept in the first instance by the employees of that undertaking, and expenditures were classified by their own engineers or accountants (see I 22 Gas, I 22 Electricity, and I 14 Tramways). At the end of each year the accounts, including the vouchers representing the expenditures, of all municipal undertakings examined by the experts of the Committee, with the exception of the

Liverpool electric lighting plant, were examined, audited and certified by professional auditors, *i. e.*, chartered accountants, who were appointed for this purpose by the city council in all cases except in the Borough of St. Pancras and the London County Council, where the auditors were appointed by the Local Government Board, a department of the central government. The accounts and vouchers of the electric companies visited and of the South Metropolitan Gas Company were audited by accountants appointed by the Board of Trade, another department of the central government; those of the Sheffield Gas Company, by an auditor appointed by the city council; and those of the tramway companies and the Newcastle and Gateshead Gas Company, by the companies themselves, although in the case of Newcastle and Gateshead the appointment was approved by the town councils (see H 18 to 20 Gas, H 18 to 20 Electricity, and H 10 to 12 Tramways).

The auditors of all the undertakings were of such high repute that it seems an insult even to suggest that they would sign any report which was not accurate, even though they were appointed by the council to audit the accounts of a department of the city government. There is also generally an audit by persons appointed by the shareholders in companies, or by the elective and mayor's auditors in the case of cities. This audit is usually more or less perfunctory, but if any false or crooked accounting were seriously believed to exist, the ratepayers could elect auditors who would most certainly uncover it.

Messrs. Turner and James report (I 15-31 Gas and E. L., 1 9-22 Trams) that the accounts of each undertaking were kept entirely distinct, that all items were charged to the proper accounts so far as they could learn, that the only omitted items of expense were unimportant (not exceeding £1,500 in any case), being for the services of the town clerk, architect, treasurer, etc., that the free service and other items of receipt which might have been credited to the undertakings much more than covered these expenses, that the methods of collecting bills were satisfactory, and that the form of accounts was essentially the same for all plants. For them to have been absolutely certain that there were no errors, intentionally or unintentionally, would have required an examination and verification of the vouchers—a duplication of work already done by chartered accountants whose standing no one would question. (Mr. Turner, one of our accountants, was auditor of the Manchester accounts for three years.) In view of these facts, it would seem that the accountants of the Committee wisely decided to accept the audited accounts without personal examination of the vouchers.

A further guarantee of the accuracy of the accounts is the control the Local Government Board has over the municipalities in respect to loans and sinking funds (D 22, 25, 41 and 42). In the local inquiries that are held before loans are sanctioned and in the strict surveillance kept over sinking fund payments, it is quite

likely that if there were any serious wrongdoing the Local Government Board would find it out; but no instances were reported.

GAS LIGHTING—GREAT BRITAIN.

In this discussion of results the gas industry is considered first, as it probably affords the best field for a comparison of public and private management. The companies have perpetual franchises which can only be terminated with their consent or by a special act of Parliament. Municipal operation has been tried for many years. The municipal and private plants are about equally distributed as to geographical location and as to density of population. Reports are made to the Board of Trade by all undertakings and are published annually, and there is full publicity of all financial and technical matters.

As to competition, both public and private plants are upon the same ground, for competition between different gas companies has practically been eliminated. It was tried quite generally up to the middle of the last century, but was found to be extremely wasteful, to be productive of rate wars for which the consumers had ultimately to pay, to increase the price of gas finally, to endanger life and property and to provide no adequate means for the regulation of the private companies. There is a kind of competition which still obtains, however, and that is competition by comparison. If the citizens of one town are getting better gas or at a lower rate than the citizens of another, the latter naturally wish to know the reasons therefor, and if they are not forthcoming public discussion follows. In the case of a company there is no effective means of bringing the officials to book except by refusing to use gas; but this is a very indirect and ineffective method, and often injures the citizen more than the company. In the case of a municipal plant, however, not only is there this method, but there is an appeal to the council and the election of new members to give a more efficient administration. Thus, the people may rid themselves of maladministration at any time if the undertaking is municipally operated. But not so in a company undertaking; there the only remedy is municipal purchase at a high price and after tedious delays. The companies have perpetual franchises and cannot be forced to sell, except by act of Parliament, which is seldom passed unless the municipality has first agreed to the terms of the company. Read the history of the taking over of the private gas plants of Glasgow, Birmingham and Leicester, if there is any doubt of the importance of these facts (see Gas, A 5-8).

The investigation planned by the Committee comprehended a thorough examination of a few selected undertakings by expert accountants, engineers, statisticians and economists. The municipal plants selected were those of Birmingham, Glasgow, Manchester and Leicester. The first three are respectively the largest plant in England, the largest in Scotland and the oldest municipal plant in Great Britain. Leicester was added as a fairly representative plant of medium size. Lest one should get the idea that these

plants are the only successful instances of public operation, and therefore not representative, it should be stated that there are three municipal plants that sell gas at a lower figure than the lowest one of the four just mentioned, and that twenty undersell the highest of the four. Of the 34 plants that sell gas at less than 30d. per thousand (including meter rents), the municipal plants rank seventh, tenth, twenty-fourth and thirtieth, and among the public plants alone they rank fourth, fifth, fifteenth and twenty-first. It may be interesting to note that of these 34 plants, 24 are public plants and 10 private. (These facts are from *The Gas World Analysis of Accounts of Gas Undertakings,* 1906.)

The companies selected were the Sheffield company, the Newcastle and Gateshead company and the South Metropolitan company of London. The first is generally conceded to be the best-managed private company in Great Britain, and next to it comes the Newcastle company. The South Metropolitan company is the best London company by far. It sells gas from 5d. to 9d. per thousand cheaper than any other and is the most economical and progressive Metropolitan undertaking. All of these plants stand very much nearer the head of the list than do the municipal plants. In the 34, they rank second, third and ninth; and among the companies alone they stand first, second and fifth.

The four municipal plants selected are more representative, therefore, of the entire number of public undertakings than the three companies, and a comparison made between these two groups will naturally be less favorable to municipal operation than if the very best plants had been selected, or if ones as near the top as the three companies had been chosen. In order to eliminate doubt as to the accuracy of conclusions based upon the results of these few plants, the facts given in the Parliamentary Blue Books and the analyses made by experts in Great Britain have also been used. It is believed that by combining the minute examination of a few plants made by the experts and the broad analyses for the whole field, conclusions will be reached that are entirely trustworthy.

FINANCIAL CONDITIONS—Municipal Purchase.

With the exception of the Manchester plant, all the municipal gas works examined by the experts were purchased from private companies during the ten years between 1869 and 1879. As the towns had no right to condemn these plants under the law of eminent domain and no power of compulsory purchase, the amounts paid were virtually the market values of the undertakings, including not merely the tangible property but all rights and franchises. These amounts were greatly in excess of the original cost or of the then value of the physical assets, as is shown by Table 31, which gives the capital outlay of the companies purchased and the amounts paid by the municipalities.

From the financial point of view, the practical result of these conditions was that Birmingham, Glasgow and Leicester began municipal operation with an excess of capitalization above original

outlay equal to from 124 to 154 per cent. of the original outlay of the companies, and probably more if the real value of the physical property were ascertainable. In other words, for every £100 invested by the companies the cities had to pay from £224 to £254, and at least 55 per cent. of the price paid by each of three municipalities was not represented by physical assets. Upon this excess capitalization the municipalities had to pay interest and sinking fund charges to write it off within a reasonable time. These charges had to come out of revenue and necessarily made the rates for gas considerably higher (about 3½d. per thousand cubic feet of gas sold upon the average for the whole period to date) than they would have been if the plant had been acquired at the value of the physical property only, or at the amount of the original outlay.

TABLE 31—CAPITAL OUTLAY AND PURCHASE PRICE.

Undertakings.	*Capital Outlay at Date of Purchase.*	*Price Paid by Municipality.*[1]	*Excess of Price Over Outlay*		*% of Excess of Price.*
			Amount.	*Per cent.*	
Birmingham	£965,361	£2,452,701	£1,487,340	154.1	60.6
Glasgow	532,317	1,278,000	745,683	140.1	58.3
Leicester	220,000	493,000	273,000	124.1	55.4
Total	£1,717,678	£4,223,701	£2,506,023	145.9	59.1

These statements should not be construed as questioning the advisability of municipalization. The financial side of the problem is not the only side, and at this distance from the events, it is difficult to get a true perspective of the whole scene, but it is a matter of record that knowing all of the facts and appreciating the high prices which the companies were forcing them to pay, the town councils voted overwhelmingly in favor of municipalization.

Present Structural Value.

The question naturally arises: How have the municipalities handled the large volume of "water" in their securities? This question can be answered satisfactorily only after comparing the *present* value of the assets and the liabilities of each undertaking. A valuation of the physical property of the seven gas undertakings —private as well as public—has been made by two engineers, Mr. Klumpp and Mr. Newbigging, who were instructed:

"to ascertain the present structural value of the plant, exclusive of the franchise, prospective profits, monopoly rights, good will, etc. Consideration should be taken of the condition of the plant, cost of duplication, state of the industry and the value of the plant in view of the latest processes and new inventions. Allowance should be made for the legitimate expenses of organization of company or department, securing

[1] Birmingham and Glasgow issued perpetual annuities in part payment of the purchase price, and the capitalized value of these annuities naturally depends upon the rate of capitalization. In computing the amounts for these two towns the annuities have been capitalized on a 3% basis—the same percentage adopted by the accountants, Messrs. Turner and James, in computing the liabilities owing by the municipalities at present. Leicester issued 4% stock redeemable at par at any time, and hence the value there given is the face value of the stock.

of legislation, cost of services, engineering advice, preparation of plans; in fact, all items that would at present need to be expended to construct and put into operation a plant duplicating the one now existing."

The appraisals, the details for which are given under H 9, Gas Schedule III., were made in accordance with instructions except that expenses of organization and Parliamentary costs—the expenses for securing powers (franchises)—were not included owing to the impossibility of making any definite estimate.

If to these appraisals are added the "Other [live] Assets," such as accounts due, stock, cash, investments, etc. (given under K 1 and 2), the sum total will be the present worth of the undertaking, exclusive of franchise, etc., which is given in Table 32, column 1. The total liabilities outstanding, including the capitalized value of the perpetual annuities as computed by Messrs. Turner and James upon a 3 per cent. basis and the premium on the Manchester irredeemable stock, are also given in Table 32 (for details see K 1 and 5). The book liabilities, or surplus funds, which the undertakings would not be obliged to pay upon liquidation because due to themselves, are omitted, of course. Comparing these items, it is found that in every municipal undertaking there is at present an excess of *assets over liabilities* varying from 10.1 per cent, to 85.5 per cent., or an average of 36 per cent. That is, if the municipal undertakings were sold to-day at the present structural value of their physical assets, if all accounts were closed and paid, and if all liabilities were retired at the present rate of capitalization, the municipalities would have a surplus of nearly £3,000,000 or 36 per cent. This is true of no company except the Sheffield company, and considering the companies as a group, they show an excess of *liabilities over assets* of £2,700,000, or 28.3 per cent. Hence the municipal undertakings could stand a shrinkage of nearly £3,000,000 in their assets before their liabilities would be affected. Two companies are already behind to the extent of £3,300,000 and would be in dire distress if their assets should shrink £3,000,000. The Sheffield company is the only one which would not be affected by a proportionate loss. Hence it is evident that the municipalities are in a much better condition to withstand, without loss to the community or without increasing prices, any sudden change in the gas industry or any decline in values due to new inventions. They have followed a much more conservative and sound policy. For every £100 of assets, they have only £73.6 in liabilities, while the companies for every £100 of assets have £128.3 in liabilities.

Before leaving this phase of the subject, the reader should again be reminded that in valuing the assets, no account has been taken of franchise rights. Consequently, the mere fact that in two companies liabilities exceed assets does not indicate by any means that they are unsound or that their present dividends are not earned. Each of these companies has valuable rights—franchises—which would bring large sums of money if put up for sale. Likewise the municipalities could dispose of their rights for large sums. But as the value in each case would have to be estimated,

and as this would introduce an element of uncertainty, it was considered preferable in this discussion to eliminate franchises in all cases and to deal only with certainties. That each undertaking is solvent is beyond doubt, but it is also true that the municipal plants have a larger margin of safety by some £3,000,000.

TABLE 32—PRESENT VALUE—ASSETS AND LIABILITIES.

Undertakings.	*Appraisal of Assets.*	*Present Liabilities.*	*Excess of Assets over Liabilities.*	*Excess of Liabilities over Assets.*	*Liabilities per £100 of Assets.*
Birmingham	£3,800,352	£3,056,817	£743,535	.....	£80.4
Glasgow	3,371,828	2,533,158	838,670	.....	75.1
Manchester	2,731,008	1,472,338	1,258,670	.....	53.9
Leicester	1,304,870	1,184,910	119,960	.....	90.9
Municipalities	£11,208,058	£8,247,223	£2,960,835	.....	£73.6
London So. M.....	£5,962,620	£8,712,336	.....	£2,749,716	£146.1
Newcastle	1,853,668	2,477,275	.....	623,607	133.6
Sheffield	1,743,354	1,074,282	£669,072	.....	61.6
Companies	£9,559,642	£12,263,893	Net	£2,704,251	£128.3

Growth of Net Assets.

Comparing the excess capitalization at the date of purchase, due to the high price demanded by the companies, with the present excess (or deficiency) of structural value over liabilities, the whole gain (or loss) for the period will be shown—Table 33. The municipal undertakings have not only accumulated a large surplus, but in doing it they have also wiped out the "water" which they had at the beginning. Since operation was begun, the municipalities have added to the value of their undertakings out of earnings £5,466,858 (48.8 per cent. of their present assets) over and above all increases in liabilities, while the companies have added £2,704,251 (equivalent to 28.3 per cent. of their present assets) to their liabilities without any equivalent increase in the value of their assets.

TABLE 33—GROWTH OF NET ASSETS.

Undertakings.	*Excess of Liabilities.*		*Excess of Assets 1905.*	*Total Gain or Loss.*
	Date.	*Amount.*		
Birmingham	1875	£1,487,340	£743,535	£2,230,875
Glasgow	1869	745,683	838,670	1,584,353
Manchester	....	.....	1,258,670	1,258,670
Leicester	1878	273,000	119,960	392,960
Municipalities	....	£2,506,023	£2,960,835	£5,466,858
London So. M.....	....	.....	Loss £2,749,716	£2,749,716
Newcastle	....	.....	Loss 623,607	623,607
Sheffield	....	.....	669,072	669,072
Companies			Net Loss £2,704,251	£2,704,251

The explanation of the methods whereby these results were brought about is simple. The two companies which show a decrease in assets as compared with liabilities issued stock bonuses for which no money was paid, the South Metropolitan in 1896 to the extent of £3,851,666 and the Newcastle company in 1901 to the extent of £826,142 (see D 21, D 22, J 2, J 4, K 2 and K 3, Gas). If these stock bonuses less the premiums received on other issues, are deducted from the liabilities, the South Metropolitan company will have a surplus of assets over liabilities of £299,175, or 5.3 per cent. of the liabilities; and the Newcastle company's deficit will be cut to £190,478, or 10.3 per cent. of the assets. Thus, the deficit of the South Metropolitan company came from stock bonuses, and that of the Newcastle company partly from a stock bonus and partly from a failure to spend as much money out of earnings for repairs as necessary or from a failure to write off a sufficient amount for depreciation. The Sheffield company—the only one with a surplus—built it up out of earnings, partly by payments to a reserve fund and credit balance, and partly by charging capital expenditures to revenue account. No company maintained a sinking fund or charged off depreciation, except upon meters and stoves (see I 27, 28, Gas).

All the municipalities accumulated their surpluses out of earnings. Each maintained a sinking fund and paid off liabilities; each wrote off depreciation, but Leicester only upon stoves and meters; each accumulated certain funds; and each spent considerable sums annually upon maintenance and repairs (see I 27, 33 and L 5, Gas). There were no statutory obligations regarding any of the matters except sinking funds, and many of these funds were for shorter periods than required by statute. The policy of squeezing out the "water" and of accumulating a surplus in such a short period was, therefore, consciously and voluntarily adopted by the municipalities.

Depreciation.

Tables 32 and 33 dispose of the question usually encountered as to whether sufficient allowance has been made for depreciation. If one considers only the "depreciation funds" so-called, he may conclude that many of the undertakings are hopelessly in default, for Birmingham, Glasgow and Manchester are the only ones among the municipalities or the companies that have written off "depreciation" and called it such (three others have in the case of stoves and meters only). But depreciation of plant may be provided for in several ways: First, by writing down the capital value every year; secondly, by the accumulation of a "depreciation fund," or any other fund to replace the plant or any part when it is worn out or has become antiquated; thirdly, by sinking fund payments to retire the liabilities when the plant or part thereof for which the money secured by the issue of these liabilities was spent needs replacing; fourthly, by paying for renewals, replacements and even extensions out of yearly revenues.

Now, if depreciation due to every cause is provided for by any *one* of these methods, it is not necessary to provide for it

again in another way. If a sinking fund is being accumulated so that the bonds will be paid off by the time the steam engine, for example, to purchase which these bonds were issued, is worn out or displaced by a more economical engine, what necessity is there for a depreciation fund for this engine? If all renewals and replacements are paid out of revenue, what need is there for a sinking fund or a depreciation fund? Take the Sheffield company, for example. It has had no depreciation fund, and has written off no depreciation except upon meters and stoves. It has maintained no sinking fund, and the only fund it does have is a reserve fund of £86,848 besides a credit balance in profit and loss account of £83,972. Yet the present value of its assets exceeds its liabilities by £669,072—a condition brought about by defraying expenditures properly chargeable to capital out of revenue.

It is maintained by some persons that a sinking fund should be provided by municipalities in addition to depreciation, renewal and reserve funds and that no matter how large these funds may be they can not be made to take the place of a sinking fund. Now it is quite obvious that it may be advisable to have a depreciation fund in one case, a sinking fund in another, a renewals fund in a third, to write down capital in a fourth, to pay for renewals and replacements out of revenue as they occur in a fifth, or in a sixth to combine certain features of two or three methods. But if depreciation of every kind and from every cause is provided for by one means, another method is unnecessary. Further, if municipalities should provide a sinking fund, why not companies?

It is therefore unsafe to decide whether provision has been made for depreciation merely from the existence or non-existence of a "depreciation fund" or of a reserve fund or even from the size of the charges for maintenance and repairs from year to year. They may be very helpful in the absence of an appraisal of the plant, and even decisive if all conditions are carefully analyzed, but the only absolutely sure way of telling is to compare the present structural value of the plant plus the live assets with the net liabilities or obligations of every sort. Applying this test to the plants investigated, it is seen that every municipal undertaking has set aside more than was necessary, for assets exceed liabilities to a considerable degree. This is true of only one company—the Sheffield company. The South Metropolitan is considerably behind, unless one disregards the stock and bond bonuses. The Newcastle company has made inadequate provisions even if the bonuses are eliminated.

Eliminating the stock and bond bonuses from the comparison in Table 32 and disregarding for the moment the "water" in the capitalization of the plants purchased from companies at the beginning, for this ought to have been written off out of earnings, it will be found that every plant but one has something of a surplus and therefore has charged capital expenditures to earnings. The Newcastle company was the only one which did not set aside a sufficient amount to keep up the works. The average for the municipal undertakings for the whole period was about 1.5d. for each

thousand cubic feet of gas sold from the date of purchase; for the companies about .25d. In other words, the consumers contributed these amounts to the upkeep of the undertakings, and if they had not done so, prices could have been reduced by these amounts.

The fact that the plants were extended or improved—that capital expenses were charged to earnings—shows how careful and conservative the municipalities have been. As one looks back upon the years that have passed, he sees that up to the present moment there has been no need of taking such large sums out of earnings, of requiring the consumer to contribute so considerably to the upbuilding of the plant. But one can never safely predict what the future of an industry will be, and although the rate at which the stocks of private gas companies are quoted in the stock market—upon a 4 and 5 per cent. basis—is not greatly above the rate for municipal bonds backed by the taxing power, it was a wise and conservative policy that the municipalities followed in making their plants worth more than their liabilities.

Whether the past consumer suffered for the benefit of the taxpayer and of the present consumer, is an exceedingly difficult question to answer, but it may be remarked that there is one very important difference between companies and municipalities in this regard. If the consumer has been overcharged to build up the plant, the property he has produced is within his reach and belongs to him. But the consumer of a private company may or may not get it. The plant does not belong to him but to the shareholders. They may distribute his overcharge in dividends, unless they have already reached the maximum rate allowed by law, which is true of only one company here considered—Sheffield. They may give it to the employees or even donate it to some charitable institution, but the consumer has no jurisdiction over it.

Payments to Relieve Taxation.

The municipal undertakings have not only increased their assets, but they have made large payments in relief of taxation. These payments, as reported by the accountants from the records of the undertakings, are given in Table 34 for the whole period of operation, and show that the municipalities contributed to the relief of taxation a total of £4,517,674, an average of about 2.5d. for every thousand feet of gas sold, and that the companies contributed nothing. One naturally asks: Were not payments made indirectly by the companies, and were there not some charges to be deducted from the amounts paid by the municipalities? To definitely decide this question an investigation into the accounts of every year would be necessary, but judging from present conditions, the corrections to be made would not materially affect the average figures.

The total amounts per thousand cubic feet of gas sold during the whole period of supply, which went to pay off excess capitalization, to build up the plant above liabilities and to the public through payments in aid of taxation, were about 6.5d. for the municipal plants and .25d. for the companies. In other words,

if the plants had started even, as did the companies and Manchester, if the plants had not been extended out of earnings, and if no money had gone to relieve taxation, the rates for gas could have been lowered in municipalities upon the average 6.5d. per thousand cubic feet each year and in the companies .25d.

TABLE 34. PAYMENTS TO RELIEVE TAXATION TO 1905.

Undertakings.	*Total Amount.* (*K* 5.)	*No. of Years.*	*Annual Average Payment.*	*Estimated Annual Average per M.*
Birmingham	£1,225,836	29	£42,270	2.5 d.
Glasgow[1]	21,235	36	590	...
Manchester[2]	2,689,302	62	43,376	4.5 d.
Leicester	581,301	27	21,530	4.5 d.
Municipalities	£4,517,674	..	£107,766	2.5 d.

Analysis of Accounts for 1905.

The statistics for the current year, as set forth in Table 35, subhead A, confirm the statements above made for the whole period of operation. Three municipalities set aside out of earnings a larger total to maintain or extend the plant or wipe out indebtedness than any company, and Glasgow's allowance was equal to the highest company (total A). The average for the companies was 6.14d. and for the municipalities 7.66d., which was 1.52d., or 25 per cent. more. Beyond question the municipalities are still providing abundantly, more than is necessary apparently, for maintenance, replacements and depreciation of every sort.

All the municipal plants except Glasgow, which is prohibited from doing so by law, contributed during the year under review considerable sums "in aid of rates"; that is, they paid certain amounts into the public treasury, and if such contributions had not been made, the rate of taxation would have been increased or certain governmental functions curtailed. According to their reports, the gas companies paid nothing directly "in aid of rates."

Regarding the use of gas profits to relieve taxation, the four municipal plants chosen for special examination are not representative of the general practice in Great Britain. The general policy, provided by statute in Scotland, is to give service at cost, which includes sinking fund charges to wipe out the liabilities when due, depreciation and maintenance charges to keep the plant up to date and reserve fund payments to provide for unforeseen contingencies, as well as the ordinary operating costs and fixed charges. Perhaps if there happens to be any surplus over and above these amounts, it may be paid to relieve taxation, but ordinarily any large sum is carried as a balance and prices are reduced the following year. There are several other municipalities besides the four here treated that pay large sums into the general town treasury, but the majority do not.

[1] Since 1876 Glasgow has had no authority to use profits from the gas works to relieve taxation (see D 23, Gas).

[2] These amounts relate only to the period from 1843, when the plant was transferred from the police commissioners to the town council.

TABLE 35—COMMUNITY CONTRIBUTIONS FOR THE YEAR 1905 OR 1905-6.

(Per M. cu. ft. of gas sold in pence.)

A.	*Birmingham.*	*Glasgow.*	*Manchester.*	*Leicester.*	*Municipalities.*	*London. So. M.*	*Newcastle.*	*Sheffield.*	*Companies.*
Maintenance, repairs, etc. (L 5)[1]	7.62	4.31	4.65	5.68	5.63	6.61	4.06	6.23	6.14
Depreciation fund (M 3)	Note[2]	1.00[2]	....	....	.31	....	....	....	....
Sinking fund (M 2)	1.46	1.30	2.19	1.90	1.64	....	....	....	....
Other funds (M 3)	....	....	.31	....	.08	....	....	....	....
A. Total expenditures for plant	9.08	6.61	7.15	7.58	7.66	6.61	4.06	6.23	6.14
B.									
Receipts omitted (I 30, 43-5)	.86[4]	.02	....	.04	.30	.22[3]	.27[3]	....	.19
Expenditures omitted (I 29)	.04	....	.08	.18	.05	....	....	....	....
Net amount	.82	.02	*.08*	*.14*	.25	.22	.27	....	.19
In aid of rates as reported (M 3)	1.96	....	3.02	5.69	1.98	....	....	....	....
B. Total to relieve taxation	2.78	.02	2.94	5.55	2.23	.22	.27	....	.19
C.									
Local rates paid	1.19	1.05	2.16	1.61	1.44	1.59	1.02	1.55	1.49
Income tax charged in accounts	.38	.28	.24	.67	.34	....	.48	....	.08
Correction for income tax	....	....	.19	....	.05	.44	....	.52	.38
C. Total rates and taxes	1.57	1.33	2.59	2.28	1.83	2.03	1.50	2.07	1.95
D. Total A+B+C	13.43	7.96	12.68	15.41	11.72	8.86	5.83	8.30	8.28
E. Ditto less 7.50d	5.93	.46	5.18	7.91	4.22	1.36	*1.67*	.80	.78

[1] In order to place all of the plants upon an equal footing, the repairs to street lamps equivalent to .13 d. in Birmingham, .04 d. in London and .10 d. in Newcastle per M. cu. ft. have been omitted from the totals given in M. 3, as these are the only plants that kept the lamps in repair.

[2] The charges for maintenance and repairs contain a sum written off for depreciation equivalent to 2.37 d. per M. cu. ft. Notes continued on following page.

In the special report upon taxation it is stated that both municipal and company undertakings are taxed and that the law recognizes no difference between a public utility owned and operated by a company and one by a local authority. It was found, however, that in practice the municipal plants were assessed higher relatively than the company plants, and if the rate of taxation had been the same in all places, the amount of "rates and taxes" paid would have been greater. But as the rate for local taxation was less in the cities where there were municipal gas plants than when there were companies, the actual amount paid was less per thousand cubic feet sold, as shown by Table 35.

In the analysis of reported expenditures for rates and taxes, it was found that in three of the gas undertakings, part or all of the income tax levied by the Inland Revenue officers and paid by these undertakings to the government had later been deducted from the interest or dividends paid. The corrections necessary to bring all plants upon an equality are given in Table 35, subhead C. With these allowances, it is found that the municipalities paid upon the average 1.83d. per thousand for rates and taxes, and the companies 1.95d., or .12d. more, a slight difference.

All these contributions are in a sense for the benefit of the community, for even an extension of plant out of revenue makes it *possible* for the undertaking to lower prices in the future because of the lower capital charges, there being no interest or dividends to be paid upon the outlay for the extension. The sum total of these contributions is shown in Table 35, the municipalities providing 11.72d. per thousand cubic feet upon the average, and the companies 8.28d., a difference of 3.44d.

·Continuation of Notes relating to table on page 202.

[a] The amount actually set aside this year was 1.49 d. per M. cu. ft., but as .49 d. was taken from credit balance of Profit and Loss account, and does not belong to this year's working, it is omitted here. It is this .49 d. that Mr. Clark, on page 414, calls a loss; but it was not a loss any more than the transfer made by the So. M. was a loss.

[b] This item consists of £14,963 for gas used for public lighting and paid for at a lower rate than the rate to ordinary consumers (see I 30); of £4,000, as interest on funds paid directly in aid of rate without going through the department (see I 30), and of £3,295, the expenses for maintenance and repairs of street lamps (see L 5). The last item is included because four plants did not spend anything for maintaining and repairing street lamps, the work being done by special city departments; and to place all plants upon an equality, it is necessary to treat the expenses for this item when they are paid by the undertaking as contributions in aid of rate (see I 45).

[c] The amount for the South Metropolitan Company is made up of £1,883, the amount spent upon repairs of street lamps above what was paid by the local authorities (L 5), of £9,302 for the difference between the rate paid by them for gas and the rate to the ordinary user (H 9, I 2-5).

[d] This item is composed of £1,162, the sum spent for maintenance, repairs and renewals of street lamps (L 5, Gas), and £2,097, being 4% of the value of the lamps owned by the company, this being the only case where the lamps are not owned by a special department of the city.

COMPARISON OF COSTS.

Now it is quite evident that a plant which pays heavier taxes, charges off more for extensions and contributes larger sums to relieve taxation than another, must of necessity, other things being equal, charge a higher price for gas. To place them upon an equality, therefore, one must deduct from prices and from expenditures all such charges that are above the normal. If we consider 6d. per thousand as adequate to provide for all charges due to depreciation, replacement, etc., and 1.50d.—the Newcastle rate—as a minimum amount for rates and taxes, and if we deduct this sum—7.50d.—from the total opposite each plant, we shall have the amount which each undertaking spent above this normal. This is shown in Table 35, subhead E.

There are several other factors which vary greatly from place to place. A plant that is located near a coal mine, for example, has a decided advantage over one many miles away, and one at the mouth of a mine which yields good gas coal, over one in a poor gas-coal field. The market for residuals is most important. The existence of industries in the locality which utilize by-products will make the production of gas much cheaper than it otherwise would be. Thus the Sheffield company, which is able to buy good gas and coke-making coal at a lower price than any other company or municipality (see I 27) and which finds a market for its coke at its very door in which it receives more per ton than any other undertaking save one (I 40), sold its by-products for more than the cost of its coal, oil and other supplies, making a profit thereon of 2.13d. per M. cu. ft. of gas sold. No other undertaking was so fortunate, and a comparison as regards prices and costs between Sheffield and any other plant not so well situated would be misleading and unfair. The actual expenditures for coal, oil, enrichers and supplies, and the receipts from the sale of residuals per M. cu. ft. of gas sold are given in Table 36.

In order to reduce the undertakings to a fair basis of comparison, suppose we assume that the residuals paid the cost of gas materials in every plant. To determine what the price of gas would have been under equal conditions, it is necessary to subtract the net cost of coal from the average price at which gas was sold during the year. (The average receipts are worked out in the following pages and are summarized in Table 43.) It has already been pointed out that certain deductions should also be made to equalize charges for maintenance, rates and taxes, contributions to the public funds, etc. Making these deductions, it is found (Table 36, last column) that the average price at which gas could have been sold by the municipal plants would have been 16.84d. per M. and the companies 21.31d., *provided* that residuals had just paid for gas materials, that the same amount (7.50d. per M.) had been spent by each plant for maintenance, depreciation and taxes, that nothing had been paid to relieve taxation, and that all plants were on an equality in these regards. Table 36 shows a great superiority for municipal management, for not only is the

average some 4.47d. lower, but the highest figure for any municipality—Glasgow—is over 2d. below the lowest company—Sheffield.

TABLE 36—NET PRICES OF GAS.

(Per M. cu. ft. of gas sold, in pence.)

Undertakings.	*Cost of Gas Materials.*	*Receipts from Residuals.*	*Net Cost of Materials.*	*Charges Above Normal.*[1]	*Total Last 2 Cols.*	*Average Receipts. (Table 43.)*	*Net Price.*
Birmingham	12.72	7.64	5.08	5.07	10.15	25.93	15.78
Glasgow	14.37	7.67	6.70	.44	7.14	25.14	18.00
Manchester	12.75	5.89	6.86	5.18	12.04	28.56	16.52
Leicester	11.37	7.80	3.57	7.85	11.42	28.90	17.48
Municipalities	13.11	7.21	5.90	3.92	9.82	26.66	16.84
London	12.84	9.55	3.29	1.14	4.43	25.76	21.33
Newcastle	10.24	7.99	2.25	*1.94*	.31	22.46	22.15
Sheffield	8.11	10.24	*2.13*	.80	*1.33*	18.97	20.30
Companies	11.68	9.41	2.27	.59	2.86	24.17	21.31

Explanation of Lower Cost in Municipal Plants.

The question naturally arises: To what causes is this superiority due? The answer is to be found in Table 37. It gives first of all the *actual* operating expenses outside of gas materials, maintenance and depreciation, represented by Total A. To these respective amounts are added the interest and dividends paid, miscellaneous expenses (one small item only), and the balance carried to profit and loss account for the next year, giving Total B, from which are deducted the small miscellaneous receipts. If to the net amount "C" be added uniformly 7.50d. per M. for maintenance, depreciation and taxes, the net cost will be the same as given in Table 36 (except .01d. in a few cases due to the dropping of the figures less than .005d.).

An examination of Table 37 shows that as far as operating expenses are concerned there is not much difference between the two classes, and the same is true of miscellaneous receipts. Practically all of the difference narrows down, therefore, to the three divisions, interest, dividends and credit balance. The municipal plants average 3.31d. per M. in expenditures for these purposes, the companies 7.53d. or 2 1/3 times as much. In other words, if the municipal and company undertakings were upon an equality in everything else, the former would still have an advantage of 4.22d. per M. cu. ft. and would be able to sell gas that much cheaper.

[1] These charges are not so large as those given in Table 35, for only the amounts *actually paid* in relief of taxation are used, less the omitted expenditures. This is necessary because in computing the average net receipts used in Table 36, the omitted receipts were not included on the receipt side and should not be included therefore in the amount of excess charges.

TABLE 37—ANALYSIS OF EXPENDITURES. (Per. M. cu. ft. of gas sold in pence.)

	Birmingham.	*Glasgow.*	*Manchester.*	*Leicester.*	*Municipalities.*	*London.*	*Newcastle.*	*Sheffield.*	*Companies.*
Manufacturing salaries (L 5)	.29	.19	.23	.33	.25	.49	.42	.29	.45
Manufacturing wages (L 5)	2.71	3.54	3.68	2.54	3.20	2.36	2.97	2.47	2.48
Purifying supplies and wages (L 5)	.99	1.34	.47	.36	.89	.75	.81	.44	.71
Other manufacturing exp. (L 5)	....	.25	....	....	.08	....	....	....	....
Less discounts on purchases (L 5)	.10	....	....	....	.03	....	....	....	....
Distribution wages (L 5)	.66	.63	1.34	.91	.85	.65	.72	.54	.64
General expenses (L 5)	.55	.95	1.26	.97	.91	2.49	1.60	1.27	2.16
Omitted general expenses (Table 35)	.04	....	.08	.20	.05	....	....	....	....
A. Total	5.14	6.90	7.06	5.31	6.20	6.74	6.52	5.01	6.44
Interest (M 2)[1]	3.29	3.78	2.06	5.11	3.31	1.28	1.41	.17	1.13
Dividends (M 2)[2]	....	....	....	....	....	6.35	6.56	6.93	6.48
Miscellaneous (M 3)	.04	....	....	....	.01	....	....	....	....
Balance carried to profit and loss account for next year (M 3)	....	....	....	....	....	.47[3]	.32	1.19	.08[3]
B. Total	8.47	10.68	9.12	10.42	9.52	13.90	14.81	13.30	13.97
Less interest, rents, profits and other receipts (M 1 and L 2)	.20	.17	.09	.44	.17	.07	.16	.50	.16
C. Net amount	8.27	10.51	9.03	9.98	9.35	13.83	14.65	12.80	13.81
Add for maintenance, repairs, depreciation and taxes	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50
D. Net cost omitting gas materials and residuals	15.77	18.01	16.53	17.48	16.85	21.33	22.15	20.30	21.31

[1] The figures opposite this item include interest upon loan debt, bank overdrafts and deposits (M 2), less in the case of Manchester the portion of the income tax collected from the holders of the loan debt, equivalent to .19 d. per M. cu. ft. of gas sold. The true amount of rates and taxes paid by the undertaking was therefore .19 d. more than returned under M 2, and the interest was .19 d. less. For a more complete discussion see the special report upon Taxation.

Notes continued on following page.

This is due to two factors, viz., the higher rate of interest and profit, and the greater amount of liabilities of the private plants. On interest alone there is a difference of from ½ to 1 per cent., or about .5d. per M. The *nominal* rate of dividends ranges from 4½ to 9½ per cent., which accounts for about 1d. more per M. upon an average. The "water" in the securities raises the nominal rate to a real rate of some 7 per cent., and about 1.2d. per M. are needed to pay dividends upon this "water." The remainder—1.5d. per M.—is due to the greater amount of liabilities carried by the companies, upon which interest or dividends must be paid; that is, owing to the fact that the municipalities have built up their plants out of earnings and have not distributed all of their profits among shareholders, they are to-day in a position where their fixed charges are not so heavy as those of the companies. They are in a better position, therefore, other things being equal, either to lower rates, build up their plants still more or increase payments to relieve taxation (see Table 38). It should be noted that Sheffield has followed a policy similar to the municipal plants, and if it were omitted from the comparison, the superiority of the municipalities would be much greater. This topic will be further considered in connection with operating efficiency.

TABLE 38—NET LIABILITIES AND OUTPUT.

Municipalities.	*Per M. cu. ft. of gas made.*	*Companies.*	*Per M. cu. ft. of gas made.*
Birmingham	110.5 d.	London—So. M.	162.6 d.
Glasgow	94.3 d.	Newcastle	182.7 d.
Manchester	70.6 d.	Sheffield	87.8 d.
Leicester	146.7 d.		
Average	98.8 d.	Average	154.5 d.

The Parliamentary Returns for the whole of Great Britain show this condition to be generally true, for the average amount of paid-up and borrowed capital per M. cu. ft. made is 145.3d. for the public and 185.3d. for the company plants.

The reader may wonder possibly whether it is legitimate to include dividends in computing the net cost of gas, as they are not a charge which must be paid or could legally be enforced if the receipts were insufficient. This is true, but they have been included because no company would continue if it did not make what its shareholders considered reasonable profits. Further, prices are

Continuation of Notes relating to table on page 206.

[2] The figures opposite this item are those given under M 2, less in the case of the South Metropolitan and the Sheffield companies the portion of the income tax collected from the stockholders. These amounts were .44 d. and .52 d. per M. cu. ft., respectively. Hence the true amounts of taxes paid were greater by this amount and the dividends less by the same amount than the sums given under M 2. The correct amounts are given here. See also special report upon Taxation.

[3] In order to pay the dividends for the year, an amount was transferred *from* the credit balance of profit and loss account for the preceding years.

fixed in each instance by the company itself and not by any outside authority, and if it considers the dividends too large, it may lower prices. Each company has a monopoly, and if it maintains prices at such a height that it pays 6, 8 or 10 per cent. dividends, possibly as high as the law permits, the fact that it does take such dividends must be considered as a characteristic of private management, and a characteristic voluntarily acquired. It is currently asserted by company men that they must have 8 or 10 per cent. profits, and if they do not get it, they will leave the business.

FACTORS IN COST—Quality of Gas.

In the preceding pages, in order to place all undertakings upon an equality, it was assumed that the cost of gas materials was exactly met by the receipts from residuals; but was it proper to assume that the difference in the degree to which residuals helped to pay for gas materials in the various plants was due to local conditions and not to the kind of management?

TABLE 39. REVISED COST OF MATERIALS.

(Per Thousand Cubic Feet of Gas Sold in Pence.)

Undertakings.	*Cost of Gas Materials* (*Table* 36).	*Candle Power Supplied* (*Table* 45).	*Revised Cost on Basis of* 15 *c. p.*	*Receipts from Residials* (*Table* 36).	*Revised Net Cost of Materials.*
Birmingham ...	12.72	15.10	12.66	7.64	5.02
Glasgow	14.37	20.55	11.04	7.67	3.37
Manchester	12.75	17.02	11.54	5.89	5.65
Leicester	11.37	11.00	13.77	7.80	5.97
Municipalities ..	13.11	16.98	11.92	7.21	4.71
London—So. M.	12.84	11.52	14.93	9.55	5.38
Newcastle	10.24	15.08	10.19	7.99	2.20
Sheffield	8.11	16.27	7.35	10.24	2.89
Companies	11.68	12.84	12.98	9.41	3.57

Let us consider this question in detail; and first as to quality of gas sold, for it will be shown that the municipalities supplied a higher candle power gas than the companies and that it costs approximately .6d. per thousand more to make 16 candle power than it does 15 candle power, etc. In that case the costs of gas materials per thousand cubic feet of gas sold, as given in Table 36, need revision in order to eliminate the differences in candle power. This has been done in Table 39 upon the principle that for every one candle power supplied (see Table 45) above or below 15, the cost of gas materials should be reduced or increased accordingly, .6d. It appears that whereas the net cost of materials (gross cost less receipts from residuals) before account was taken of difference in candle power was 5.90d. per thousand cubic feet for the municipalities and 2.27d. for the companies, after allowance is made for quality of gas, the figures become 4.71d. and 3.57d. respectively. Hence it appears that the assumption that cost of gas materials should be considered as exactly paid by the

receipts from sale of residuals affects municipalities and companies about equally, and that collectively little change would be made in the prices as finally worked out in Table 36 if the net cost of gas materials had been included in the price at the actual figures; but the individual plants would have varied and the comparison would not have been so fair as under the plan actually adopted.

As to the prices paid for gas materials, no evidence was found except in one place where a company was operating, to show that materials were not purchased as cheaply as possible in the open market and subject to such conditions that all competitors would be able to submit offers. The municipalities advertised all contracts, a procedure which would aid in obtaining good terms, but the companies did not (H 63-71).

Supplies and Residuals.

Passing to the other side of the ledger—the production and sale of residuals—the question becomes more complex. Table 39 shows that every company receives somewhat more per thousand cubic feet than any municipality and that the average difference is 2.2d. The explanation may be three-fold. The management of the municipal plants may be less efficient and therefore may secure a small quantity of residuals or a poorer quality; the coal used may be such that it will inevitably yield less; or the prices may be lower.

The first is fully discussed elsewhere in this report, and it is shown that there is little if any difference between municipalities and companies. There seems to be little difference also in the yield of by-products, consideration being had for the kind of coal used. The third explanation is the more important one, for although certain residuals brought more in certain towns than certain companies received, the general scale of prices where municipalities were operating was very much lower (see I 40). It may be argued that prices are very largely determined by the management, and that higher prices received by companies were due to the better grade of residuals supplied, the more careful attention given to the kind of coke demanded and other efforts to build up the trade. But no evidence has been found to support the statements generally, although there are special cases of excellence. At Leicester, for example, it was claimed that a better grade of coke was obtained by hand charging and drawing and by the handling of coke by hand; that the coke was not broken up so much and that the demand there was for large coke, hence a better price than otherwise would have been received if the coke had been handled by machinery. Leicester also has the most complete plant for dealing with tar, liquor and other residuals. Glasgow has adopted the plan of renting fully equipped chemical works to private contractors at public letting, the contractors to take all the tar and liquor. Sheffield more carefully screens and sorts coke than any other plant. But all the other plants were upon the same level

practically; they sold their tar in bulk to contractors; they handled coke by mechanical means; they screened it to various sizes to suit their customers; and each had some sort of chemical works for the preparation of by-products. All in all, therefore, there seems to be no evidence that the difference in price was due to any superior management of the companies as a group, or that the managers of municipal plants intentionally kept prices down or adopted policies which would lead to this result.

One exceptional instance should be noted, Manchester sold its residuals locally instead of advertising and of seeking the most profitable market. Salford—the neighboring city, separated from Manchester only by an imaginary line—adopted the latter policy and received higher prices, which would be equivalent to .61d. per thousand. If Manchester did what Salford does, and what companies do regularly, the net cost of gas materials would have been .61d. lower and the average net price of gas in all municipal plants would have been about 17d. per thousand according to Table 36, instead of 16.84d.

If one considers the problem from another point of view and examines the industrial conditions of the various towns, it is seen at once that the great steel industries of Sheffield and Newcastle make a good market for coke and produce high prices. At Newcastle coal is burned for the sole purpose of making coke, and gas becomes the by-product. Glasgow also has large factories and would have a fairly good market if its coke were only of a better grade, but owing to the kind of coal available it must be poor. Birmingham's industries are such that there is a fair demand and a fair price. The market for tar is poor at Newcastle, good at Birmingham and Glasgow, and excellent at London, Leicester and Sheffield. To assume that these conditions, that the location of certain industries in the neighborhoods of certain plants, and that the resulting prices are due to company management would be illogical, and a similar process would attribute to municipal management in Widnes, where the cheapest gas in England is supplied, all the credit for the existence of the chemical works in that city, which make the price of residuals so high and the cost of gas so low.

PRICE OF SERVICE.

Every undertaking of those specially examined by the experts except one (the Sheffield Company) offered the consumer a choice between the ordinary meter or the prepayment (automatic) meter. Table 41 shows the charges in pence per thousand cubic feet for each in the city proper. The rates for prepayment meters include a meter and small stove rented and set free of charge. The meter and stove charges to other users are shown separately.

The amount of gas consumed is taken to be 20,000 cu. ft. per year. The meter rentals are for five-light meters; the stove rentals, for small stoves such as usually rented by small users. The cost of setting a stove is spread over twenty years, as the principal expense is for piping from meter or nearest pipe to stove, and when

once this has been done, there is practically no further expense until the house is reconstructed, even though the stove may be changed.

TABLE 41—RATES TO ORDINARY CONSUMERS PER M. IN PENCE.

	Ordinary Meters.						Prepayment Meter Rates.
Undertakings.	Gas.[1]	Meter Rental.	Meter Setting.	Stove Rental.	Stove Setting.	Total.	
Birmingham..	28.5	....	....	3.6	.7	32.8	32.25
Glasgow.....	25.	....	....	2.4	....	27.4	30.
Manchester..	28.	....	....	....	....	28.	33.
Leicester.....	28.	....	....	2.4	.7	31.1	33.33
London.....	24.	2.4	....	3.6	.2	30.2	33.
Newcastle....	21.6	3.0	....	4.4	....	29.0	34.5
Sheffield ....[2]	18.5	2.4	....	3.6	.1	24.6	None.

An analysis of receipts (L 3) shows that no municipality charged meter rentals, that stove rentals in municipal plants were very much lower, but that owing to the lower prices for gas charged by the companies, the average net receipts per thousand cubic feet sold for all the companies were below what the municipalities received. In several towns the rates for public lighting differ considerably from those to private consumers. Further, in three instances, part of the cost of maintenance is paid by the undertaking, while in four cases the entire cost is borne by the city and paid out of the city funds. A comparison of receipts from public and private consumption proves that high prices were not charged for public lighting by municipal plants to bolster up the financial side of the undertaking, but rather that the taxpayers were helped by a low price for public lighting.

Combining both public and private supply, we have Table 43, which is obtained by dividing receipts (L 2) by the total amount of gas sold (H 12), and deducting certain gratuitous expenditures (L 5) to put all plants upon an equal basis. This table shows that the average price per thousand cubic feet in Sheffield was less than the lowest municipality (Glasgow) by 6.17d., and that the average price for the companies was 2.49d. less than the average for the municipalities.

In the previous pages it was noted that the four municipal plants selected for examination have consciously adopted the policy of paying over large sums in aid of taxation and also have charged higher prices than necessary in order to set aside these large sums. Now in this respect the municipal plants selected do not represent the general policy of municipal operation in Great Britain. The aim is rather to supply gas at such a price as will just pay all operating costs, maintain and repair the works and mains, keep them up to date in every respect, provide a sinking fund to wipe out the liabilities when due, and accumulate possibly a modest reserve fund to meet emergencies, but not to pay over large sums to relieve the taxpayer. This is clearly brought out

[1] Less the discounts allowed to ordinary consumers.

[2] The average rate for the year is taken, as prices were altered during the year.

by an analysis of the returns made annually by companies and municipalities to the Board of Trade—a department of the central government at London.

TABLE 43. AVERAGE PRICE OF TOTAL SUPPLY.

(Pence per thousand cubic feet gas sold for all purposes.)

Undertakings.	*Sales of Gas.*	*Rents of Meters, Stoves, Etc.*	*Total.*	*Less Expenditures to be Deducted.*[1]	*Net Receipts.*
Birmingham	25.94	.12	26.06	.13	25.93
Glasgow	24.82	.32	25.14	..	25.14
Manchester	28.56	..	28.56	..	28.56
Leicester	28.51	.39	28.90	..	28.90
Municipalities ..	26.52	.18	26.70	.04	26.66
London-So. M....	23.63	2.30	25.93	.17	25.76
Newcastle	20.58	1.99	22.57	.11	22.46
Sheffield	17.59	1.38	18.97	..	18.97
Companies	22.19	2.11	24.30	.13	24.17

The total average receipts per thousand cubic feet of gas sold in all of the 270 municipal plants reported for the year 1905-6 were 38.19d., as compared with 41.93d. for the 482 private companies reporting. "Field's Analysis of the Accounts of the Principal Gas Undertakings" shows that about 78 per cent. of the receipts (78.2 per cent. for the municipal plants and 78.9 per cent. for the companies) come from the sale of gas and meter and stove rentals, which would make the receipts from these sources alone 29.86d. and 33.08d. for the municipalities and companies respectively, or about 3.22d. (over 10 per cent.) in favor of municipal management.

The figures for the 27 municipal and the 36 company plants which sold over 400,000 cubic feet during the year were 36.04d. and 39.43d. per thousand respectively; and after deducting one-fourth of the gross receipts for residuals and miscellaneous receipts, the net receipts are 27.03d. and 29.57d.—which again show an advantage of municipal over private management to the extent of 2.54d. per thousand.

"Field's Analysis," which deals with 11 municipalities and 24 companies and is accepted everywhere in Great Britain as a standard authority, separates receipts from gas and meter and stove rentals from other receipts and shows that the average receipts from such sources in the municipal plants were 27.29d. per thousand and in the companies 30.96d., a difference of 3.67d. in favor of municipal operation.

[1] Maintenance, repairs and renewals of street lamps, which were not borne by all plants, and gas fitting expenses which were not paid for by consumers.

In the report of Mr. Clark and Mr. Edgar, where they apparently show the greater success of company management (pp. 345-7), only the best companies are selected, which is neither scientific nor fair. If *all* company plants had been compared with *all* municipal plants, quite different results would have been found from those given by Mr. Clark and Mr. Edgar.

They also pretend to show (p. 344) that if the municipal undertakings had sold gas at the rates in force in Newcastle or Sheffield (nothing is said about the London companies), the towns that have municipal plants would have gained immensely—a conclusion which is illogical and has no bearing upon the subject at issue. It is equivalent to saying that if a man had a millionaire's income and a pauper's expenses, he would make money. As already explained, it costs more to manufacture the gas made in the municipal plants than in Newcastle and Sheffield (not in London) and this is due to local conditions over which the municipalities have practically no control. Thus prices must be higher there.

CHARACTER OF SERVICE.

Price without regard to quality is a tale half told; and the most important element in quality is continuity of supply. All of the undertakings examined have a good record, and barring the few accidents which happen in all plants, gas has been continuously furnished by companies and cities (H 38). In December, 1904, Manchester had to reduce pressure for a time owing to a week of heavy fog, and some sections of street lamps were not lighted, but the supply was not cut off from any district, and they have had no similar trouble since. This is the only place where the maximum day's output for the year exceeded the daily capacity, the difference being 1,419 M. cubic feet. The total capacity of the holders is 25,400 M. cubic feet, which indicates that while the plant was doubtless adequate to furnish a constant supply under sufficient pressure in all but the most unusual circumstances, it was approaching the danger point (H 5 and 13). Extensions have been begun which will adequately meet the rapid increase in consumption in the past few years and provide for future contingencies.

The municipalities are better prepared to furnish an uninterrupted supply during a strike than the companies, for three have carburetted water gas plants with a capacity equal to about one-quarter of the entire capacity, whereas only one company has a water gas plant, and it cannot produce more than one-tenth of the total output (H 2). Further, the holder capacity of the municipal plants is relatively greater than that of the companies, so that in case of an accident, the former could run a greater length of time—some twelve or fourteen hours longer—than the companies, under average conditions. Proper methods for measuring and recording pressure were found everywhere. The pressure is also said to have been reasonably uniform and satisfactory. The most elaborate system of regulation was in Sheffield, where unusual methods had to be adopted because of the great variations of altitude in the area of supply. Birmingham reports the low-

est records, but these were exceptional instances and not of sufficient importance to justify any criticism. The only important case of reduced pressure was in Manchester during the week of heavy fog, to which reference has just been made (see H 32-38).

The policy relative to extensions appears to have been liberal everywhere, and only a very small proportion of the population in any area is not within reach of mains (see H 39-50). All municipalities supply districts beyond their own boundaries; likewise the companies except the South Metropolitan. The percentages of area and population supplied outside show that the municipalities have been somewhat more progressive and eager to extend their lines than companies, and that Parliament has not hindered this development (see D 11). The reports of the engineers show no essential differences between municipalities and companies relative to the removal and testing of meters (H 16), purity of the gas (H 27, 28), performance of work in the streets (H 53-58), stoppage of leaks (H 82), attention and politeness of employees (H 84-86), promptness with which orders to turn on gas were executed (H 96), provisions of offices for payment of bills and filing of complaints, the South Metropolitan company being ahead of all other plants in this regard (H 79); the maintenance of show rooms (H 18 and 19), and badging of employees (H 83). The methods of handling complaints in municipal and private undertakings were good, but the latter were somewhat better equipped and were more systematic in checking up quickly the nature of the complaint and seeing that it was quickly attended to. All undertakings, except the Sheffield company, give consumers the privilege of using an ordinary or a prepayment meter. This is as it should be, if a plant is to serve the community to the fullest degree, for in most large cities the prepayment meter meets a genuine demand. All, except Sheffield, rent stoves—thus again it is seen that the municipalities are more responsive to the needs of the people. Mr. Clark blames Glasgow for not doing more, but says nothing about Sheffield, which does less. This does not seem quite fair.

Candle Power.

The average candle power for the year under review is reported by the engineers to have been recorded as follows (see H 21-24):

TABLE 44. CANDLE POWER RECORDS.

Undertakings.	*Average c. p.*	*Location of Tests.*	*By Whom Made.*
Birmingham.....	16.32	Works.	Chemist of Department.
	15.89	Center of town.	Independent Chemist.
Glasgow.....	20.25	Works.	Independent Chemist.
Manchester.....	17.04	Works.	Chemist of Department.
Leicester.....	14.36	Works.	Central Office Official.
	14.16	Center of town.	
London—So. M.....	14.50	Six stations.	London County Council Examiner.
Newcastle.....	16.20	Works.	City Examiner.
Sheffield.....	17.37	Works.	Employee of Company.
	17.08	Center of town.	City Examiner.

From these returns, the average candle power of the gas supplied by the municipal plants proves to be somewhat higher than that furnished by the companies. But it is urged that the figures reported for the municipal plants are not accurate and therefore not comparable with those for the companies, inasmuch as the municipalities test their own gas, and that of the companies is read by official examiners not connected with the companies. It is further alleged that the methods of testing used in the municipal plants are not only not the same as those used by the companies, but that they are inferior and give a higher candle power than is correct. (See statement made by Mr. Klumpp as quoted by Mr. Clark, pp. 315-6.) These are serious charges, and deserve careful examination seriatim. First as to persons making tests.

The gas supplied by the companies was tested in each case by a person appointed by the local authorities, and these tests were probably fair and accurate according to the standards used. In Birmingham, the readings were made not by an employee of the engineer or even of the Gas Committee, but by a person selected by a separate committee of the town council (see D 17). This person was Dr. Poynting of Birmingham University, whose character and ability are above reproach and who would not possibly be influenced in a scientific test of gas by the fact that he was selected and paid by one committee of the town council when another committee made the gas he tested. Further, the chemist of the gas department reports to the secretary of the committee and not to the engineer, so that there is a double safeguard.

In Glasgow also, the gas examiner is independent of the gas department and of the Gas Committee (see D 17), being appointed by the magistrates. The present examiner is Mr. Tatlock of Messrs. Tatlock & Thomson, a firm of high standing and repute. He has held the position for 20 years, and so far as we have been able to learn, no question of his ability, fairness and honesty has ever been raised in Glasgow. But it is asserted by a member of the Committee that the candle power record of Glasgow ought not to be given credence because in 1905-6 two of the fourteen magistrates who select the examiner were members of Gas Committee. Knowing the reputation which Mr. Tatlock has and the high character of the magistrates of Glasgow, it seems almost amusing, not to say wholly unjustifiable, to discredit the candle power records upon the mere fact, unsupported by any other evidence, that two of the fourteen magistrates were members of the Gas Committee.

In Manchester the chemist who made the tests is said by our engineers to have "operated independently of the works managers" (H 21), and Mr. Newbigging, one of the gas engineers of the Committee, who lives in Manchester and who is thoroughly familiar with the local situation, states that the chemists appointed to read the candle power "would not inflate the candle power of the gas but would rather underrate its illuminating value." The only evidence which directly or indirectly reflects upon the accuracy of the candle power tests is a series of tests which were made

under the direction of Mr. King, the engineer of the Liverpool gas company, a company which has constantly been compared with the Manchester municipal plant to the detriment of the former. Mr. King's memorandum, which was handed to Mr. Walton Clark of the Committee, so far as it touches the point in hand, is:

"* * * a permanent testing place was established in the centre of the City of Manchester, and tests were made of the Manchester gas extending over a period of nine years. These tests were in every detail the same as those made on the Liverpool gas during the same period. It may be mentioned that the prescribed Parliamentary standard at Liverpool is an illuminating power of not less than 20 sperm candles with a consumption of 5 cubic feet per hour in a Sugg's No. 7 Standard Steatite Batwing Burner, and severe penalties are imposed on the Liverpool company by their acts of Parliament in case of any failure to supply the quantity and purity required. The average yearly results * * * are shown in the following table * * *:

Year.	*Official Manchester Returns.*	*King's Tests.*
1895.....	19.16 c. p.	16.20 c. p.
1896.....	19.55 "	16.49 "
1897.....	19.16 "	15.73 "
1898.....	19.51 "	17.34 "
1899.....	19.36 "	16.38 "
1900.....	19.40 "	15.86 "
1901.....	18.97 "	16.61 "
1902.....	18.54 "	14.50 "
1903.....	18.25 "	15.66 "

It will be seen that the difference between the tests made under Mr. King's direction and the official Manchester returns varied from 2.17 to 4.04 candles. There are several very important facts to be noted, however.

(1) The candle power reported by Manchester was from tests made at the works. Mr. King's tests were made in the "center of the city," he says. There would be a difference, naturally, therefore, of upwards of .5 of a candle, the exact amount depending upon the distance of the place where the tests were made from the works.

(2) Mr. King does not state where in the "center," or how many tests were made, or when they were made. In one of his letters he recommends that the exact tests which he made be not used, but that the averages be used instead. A copy of all the readings taken was not furnished us, although given to Mr. Clark, and it is impossible to tell, therefore, whether the averages given by Mr. King in the above table are true statistical averages or whether they are merely the means between two extremes. This fact is very important, for, if the latter method was adopted, the averages given by Mr. King might wholly misrepresent the true condition of affairs, for a few tests might be very low, when the vast majority were high and closely approximated the official returns.

(3) The kind of photometer used is not stated.

(4) The results are not given later than 1903, and there is no evidence whatever to show that for the year under review even

such tests as Mr. King might have made showed a difference in candle power.

(5) If a test by an impartial person, made neither by Mr. King who was interested in showing as low candle power in Manchester as possible, nor even by the independent chemists of the Manchester city government, would have shown that the candle power of Manchester was so much below what was being reported as the above table would indicate, it would seem queer that no use has ever been made of the fact by those who are opposed to municipal trading in Manchester. Furthermore, why were these tests not placed before the Committee when in England and an opportunity given at that time to investigate their accuracy and to hear what the Manchester officials had to say in reply?

In view of the above facts there seems to be no reason for refusing to accept the Manchester returns or even to intimate that they are inaccurate.

At Leicester the readings were made by an official from the central office who was wholly independent of the works managers, but he was an employee of the department. It is barely possible that he would not read as closely as an independent analyst, but the amount of error due thereto would be small. Mr. Colson, the engineer, says: "I am convinced that nowhere is this work more thoroughly and conscientiously done than with us."

In conclusion, therefore, as far as the independence, reliability and accuracy of the persons making the tests of candle power are concerned there is no difference between the companies and the municipalities, except possibly at Leicester, and there the allowance to be made would be very small. The attack on the accuracy of the records falls to the ground on this point.

The standards used in the various plants in testing candle power did vary, and obviously the records are not comparable, except in those instances where the same standard was used, until they are brought to a common basis. Consequently, the gas engineers, Mr. Newbigging and Mr. Klumpp, were asked

"to state what the candle power of the gas required by law, or stated to be the practice in the British cities whose gas works were investigated, would be, if obtained under the testing conditions obtaining in Philadelphia."

The Philadelphia test was defined as follows:

"A 60 inch open photometer bar is used; the carriage contains a Leeson disc. The gas is measured by regulation wet meter and corrected for temperature and barometer to 60° and 30°. The standard is a Harcourt 10 C. P. Pentane lamp. The burner consists of an 8 foot excavated head Lava or Steatite open flame tip."

Mr. Klumpp sent sample tips to Mr. Newbigging, the English gas engineer who was thoroughly familiar with English practice, who reported as follows:

TABLE 45—CANDLE POWER TESTS.

City.	Candle Power under 1905 conditions of testing, as returned in Schedule. C. P.	Burner.	Candle Power using American Steatite Burner, forwarded by Mr. J. B. Klumpp.	Difference (Gain or loss.)
Birmingham ..	16.32	London Argand No. 1.	15.10	—1.22
Glasgow.....	20.25	Bray's No. 7	20.55	+ .30
Manchester....	17.04	Sugg's Flat Flame Standard Burner.	17.02	—.02
Leicester	14.16	London Argand No. 1.	10.80	—3.36
London—So. M.	14.50	London Argand No. 1.	11.12	—3.38
Newcastle	16.20	London Argand No. 1.	15.08	—1.12
Sheffield	17.37	London Argand No. 1.	16.27	—1.10

"The tests were made in a 60" Letheby bar photometer, and checked with a table photometer, a 10 candle Pentane standard being used with both photometers and in each case.

"Of course, you quite understand that I have not visited the cities for the purposes of making tests of the gas, but I have had gas specially prepared to represent as nearly as possible the illuminating power of the gas given in the Schedules as being the average quality supplied during 1905."

This report shows the records of Glasgow and Manchester practically unchanged, those for Birmingham, Newcastle and Sheffield to be too high by about one candle, and those of Leicester and the South Metropolitan company too high by nearly 3½ candles. The readings given in column one were the averages at the works, except in two cases—Leicester and the South Metropolitan—where those in the center of the town were taken, but these two exceptions will neutralize each other. Upon the basis of the revised figures the average candle power for the municipalities is 16.98 and for the companies 12.57, or a difference of 4.41 candles.[1]

It is now asserted by the opponents of municipal operation, since the above facts have become known, that the provisions of the statutes were not followed in the municipal plants in making candle power tests and that the records are still too high. There is no evidence to support this assertion except that at Leicester gas was burned in certain photometers at the rate of 5.9 feet per hour instead of 5 feet as required by the statutes. However, the readings were corrected by reducing in the ratio of 5.9 to 5. This reduction the engineers agree was insufficient, but they do not state what further reduction should be made. Mr. Klumpp says 2 candles; Mr. Newbigging says it *may*, under certain conditions, amount to 2 candles, but it depends upon the composition of the gas, and that the exact amount could only be determined by tests extending over a considerable period, made with Leicester gas. Mr. Klumpp never spoke of this matter to Mr. Colson, and in view of the generous treatment accorded to the Com-

[1] These averages, like all the others given in this discussion, are weighted averages, that is, they are obtained by multiplying the amount of gas sold by each undertaking by its candle power and then dividing the sum of all these products by the total amount of gas sold by each group of municipalities and companies.

mission, Mr. Colson naturally considers it unfair that nothing was said about it until several months after leaving England and then not to him directly. Mr. Klumpp also fails to note that not all tests were made at 5.9 feet per hour corrected to 5 feet. However, if 2 candles were accepted as the extreme, the candle power at Leicester would become about 9 and the average for the municipal plants about 16.8 candles as compared with 12.57 candles for the companies.

In view of the facts already given, the complete information furnished to the Committee and the frankness with which questions were answered, Mr. Klumpp's reflection upon the willingness of the municipal engineers to allow a thorough examination of their works to be made and their gas to be tested, seems to be an unreasonable charge. By its side should be placed Mr. Newbigging's statement:

"In my opinion, Manchester, Birmingham, Leicester and Glasgow would have permitted the Commission to have made any tests that they wanted. Personally I do not think that to have taken an odd test or two, over a couple of days, would have been of much assistance. I preferred to take their own return, the accuracy of which, I have no reason to doubt."

Further, if the municipalities were so obstructive and the companies so free in this direction, why were not readings made in all the company plants. As a matter of fact only one reading was made by Mr. Klumpp in each of *two* plants—one was a municipality and one a company. It would seem strange that municipalities would refuse or evade an examination of the photometer rooms and a test of the gas when they permitted a valuation of the undertaking—a much more important matter and one which has a far greater significance. Mr. Klumpp's statement is also denied by the engineer of every municipal plant visited, and likewise Mr. Clark's insinuation that he was refused admittance to the photometer rooms (p. 316), made since his return to the United States. Other members did visit the photometer rooms. Mr. Colson denies that he said the gas in Leicester lost two candles between the works and the consumer, as quoted by Mr. Clark (p. 328).

Calorific Value.

Since the introduction of the incandescent burner, candle power has ceased to be as important as formerly when the open flame burner was the only kind in use. Where mantles are used, the consumer cares relatively little what the illuminating power of the gas may be; but he is greatly concerned with its calorific value, for the light comes from the mantle, which is made luminous by the heat due to the combustion of the gas and not from the illuminating power of the gas itself. In view of the widespread use of the incandescent burner in Great Britain, the number of British thermal units in each place becomes very important. The movement for the reduction of candle power, a corresponding lowering of the price of gas and the increase of the calorific value is now very strong, and has been approved by Parliament in some in-

stances. The status in the various plants as reported by our engineers is as follows:

TABLE 46. CALORIFIC VALUE.

Municipalities.	*B. Th. U.*	*Companies.*	*B. Th. U.*
Birmingham	(?)	London-So.M.	595 gross
Glasgow	About 650	Newcastle	(?)
Manchester	600-650 gross.	Sheffield	About 600
Leicester	560-580		

Evidently the municipalities supply gas with a greater calorific value than the companies, but the difference is not large.

Price and Quality Combined.

TABLE 47. PRICE AND CANDLE POWER COMBINED.

Undertakings.	*Net Receipts (Table 43).*	*Candle Power (Table 45).*	*Revised Net Receipts 15 c. p.*
Birmingham	25.93	15.10	25.87
Glasgow	25.14	20.55	21.81
Manchester	28.56	17.02	27.35
Leicester	28.90	11.00[1]	31.30[2]
Municipalities ..	26.66	17.00[1]	25.46[2]
London So. M.....	25.76	11.52[3]	27.85
Newcastle	22.46	15.08	22.41
Sheffield	18.97	16.27	18.21
Companies	24.17	12.84	25.47

Thus far price and quality have each been considered separately, but in order to ascertain what the consumer received in return for what he paid, it is necessary to consider the two conjointly. The only factor under the head of "character of service" for which there are definite and quantitative measures, is candle power. But no two plants supplied the same candle power. In order to bring them to a common basis, one must adopt a certain standard candle power and compute the amount that receipts would have been increased or diminished if that candle power had been supplied instead of what actually was given. As a 15-candle stand-

[1] If the extreme lowest c. p. claimed by those opposed to municipal ownership were taken, this figure would be 9.00, and the average for all municipalities about 16.8 candles.

[2] If the c. p. for Leicester were taken as 9 and the average for all municipalities as 16.8, the corresponding figures here would be 32.5 and 25.58.

[3] The figure given in Table VIII. is 11.12, but this represents readings at the testing stations which are 1.64 miles from the works upon an average (H 21). In order to make them all uniform as readings at works, .40 of a candle has been added, as this seems to be about the allowance that should be made for 1.64 miles, based upon the returns from the other plants when readings were made at works and at the center of the town (cf. H 22 and 23).

ard seems about the average, let it be adopted. Now in order to raise the candle power from 15 to 18, it would probably cost from .5d. to .75d., per candle, Mr. Newbigging, the British gas expert, says; and to lower the candle power below 15 would mean a saving of a similar amount. As .6d. per candle is conservative and the actual cost at Manchester, suppose it be taken as the proper amount. Upon this basis the average receipts or price of gas including meter and stove rents would be the amounts given in column three of Table 47. In other words, if all plants had furnished gas of the same candle power(15) they would have charged the prices given in the last column, and the municipalities would have received 25.46d. per thousand and the companies 25.47d. If the candle power at Leicester be taken as 9, the lowest claimed, the averages become 25.58d. and 25.47d. respectively. It is to be kept in mind, further, that in other respects, as pointed out in the preceding pages, the service given by the municipalities was as good and probably better than that given by the companies, all things considered.

EXTENT OF USE.

There are two standpoints from which this subject may be viewed, viz., proportion of the population who are consumers, and the amount of gas consumed. The statistics for each plant are shown in Table 48, from which it appears that, with the exception of Birmingham, all the municipal plants have a larger number of consumers relatively (i. e., fewer persons to a meter) than any of the companies, and including Birmingham, the average is considerably above the companies. If the proportion were the same, the municipalities would have some 40,000 less consumers than they do have, or about 8 per cent. In the amount of gas used by each consumer, Birmingham far surpasses every other plant, and the municipalities fall considerably below the companies as a body. Naturally, one would expect the South Metropolitan company to surpass every undertaking, public or private, for as density of population increases, the number of consumers and the amount of gas consumed increase, but while surpassing all the companies it outranks all the municipalities in only one respect, viz., the consumption per capita, and yet it has by far the most dense and compact area of all. Even Leicester with a density of one-ninth has a larger number of consumers relatively. Comparing population and consumption, it appears (column 4) that the average for the companies is above that of the municipalities. This is due to the influence of the South Metropolitan company, and if it be omitted, as the local conditions there make it exceptional, the situation is reversed and the municipalities exceed the companies.

It is also apparent from Table 48 that the municipalities, except Birmingham, have a large number of small users, especially in Glasgow, for where there is such a large proportion of the population using gas the poorer classes must be consumers and they use small amounts. The consumption per meter confirms this. Birmingham has many large consumers, and so has Leicester, which sells relatively twice as much for power purposes as Sheffield.

TABLE 48. CONSUMPTION OF GAS.

Undertakings.	*Population per Square Mile of Area of Supply.*[1]	*Population per Meter.*[2]	*Consumption per Meter. (H 14).*	*Consumption per Capita. (H 14).*	*Percentage of Prepayment Meters.*
Birmingham	6,067	7.28	53,611	7,740	33.1
Glasgow	10,204	4.20	22,446	5,821	4.3
Manchester	15,792	4.93	28,798	6,374	31.4
Leicester	2,916	4.64	32,226	7,339	54.0
Municipalities	7,972	5.05	31,323	6,653	22.3
London—So. M.....	27,273	5.11	39,946	8,095	64.9
Newcastle	4,047	6.31	32,663	5,554	43.9
Sheffield	3,481	5.74	31,747	5,951	....
Companies	7,818	5.45	37,178	7,159	49.5

The Parliamentary returns for the whole of Great Britain show this condition to be general.

Efforts to Extend Use.

The methods adopted to extend use and to increase the number of consumers were many and varied. The more direct means were canvassing, advertising and exhibitions. None of the municipalities specially investigated, except Leicester, employed canvassers, but all of the companies did; and apparently the latter also did more in the way of advertising, exhibitions and lectures. As regards showrooms, the South Metropolitan was the most aggressive, the others being about upon a par (H 18 and 19). In Birmingham, Glasgow and Manchester, the gas officials complained that the opponents of municipal trading had hindered the full development of the fittings department by opposing municipal operation in this direction; yet it is a necessary adjunct of the gas business and should be so considered.

But after all, the factors which most largely determine the extent of use are price and quality, and the municipal undertakings are relying upon these means more than upon special attractions. An enthusiastic and satisfied consumer is usually the best advertising agent an undertaking has. The South Metropolitan obtained its high consumption, not from any great superiority of its own efforts to extend use but from conditions of metropolitan life—fog, dark days, overcrowded rooms and dark tenements.

Probably the best evidence of the total efficiency of all methods is the ratio of consumers to population, for consumption per meter or per capita depends so much upon economic conditions which vary greatly from place to place that it is a less accurate standard. Table 48 shows that the municipalities have 5.05 persons per meter and that the companies have 5.45 persons. Now if

[1] Obtained by dividing population by number of square miles (D 11).

[2] Obtained by dividing population (D 11), by number of meters (H 6).

the former were not efficiently pushing for customers in one way or another, they would not be in advance of the latter. But it is true generally speaking that companies ordinarily pay more attention to the large user and the municipalities to the small user—the citizen less able to care for himself. For example, the municipalities specially examined charge no meter rentals, and it is true generally that cities are less likely to charge than companies. Of the 36 companies selling over 400,000 thousand cubic feet only 5.6 per cent. supplied meters free, while 57.8 per cent. of the 26 public plants did so.

The proportion of consumers using prepayment meters is shown in the last column of Table 48. The South Metropolitan has the largest ratio and Sheffield none; Glasgow only adopted them recently and stands next to Sheffield. Whether it is wise to push the use of prepayment meters is a policy much debated, but it would seem that no undertaking would be giving the best service to a community which did not supply prepayment meters at reasonable rates, so that any consumer might have one if he so desired or found it necessary. But a large proportion of prepayment meters does not necessarily indicate that the community is being well served, for prepayment meters are most needed where the people are poor and often they must use them even though this manner of taking gas is much more expensive than through ordinary meters. For instance, in London, where the number used is the largest relatively, gas sold through prepayment meters is 9d. per thousand more than through ordinary meters. This difference is equaled nowhere else, and if the charges made by the other undertakings are reasonable, the South Metropolitan company is too severe upon prepayment meter users, and is making them contribute more than their fair share.

CHARACTER OF PLANT—Distribution System.

Inasmuch as the extent of the system of mains affects the amount of gas consumed and the number of users, because if there are no mains in a street, the people living upon it will not—can not—consume gas, no matter how cheap or how good it may be, it is important to ascertain at this point to what extent the undertakings have extended their mains. The ideal standard for testing the plants would be the mileage of built-up streets or highways in the area of supply as compared with the mileage actually supplied with mains; but such data are available for no undertaking. In lieu thereof some less accurate tests must be applied, and these are shown in Table 49.

The first test is that of population per mile of street occupied, which shows an average considerably lower for municipalities than for companies. At first glance, this fact would seem to indicate that the former are reaching out more than the latter. But the number of people per mile of street occupied depends largely upon the density of population. Consequently, London shows a larger number of people per mile than any other place, and yet probably

almost every street in the area of supply has its gas main, which is not true of Birmingham or Newcastle, although they have the fewest number per mile relatively of all plants.

Adopting mileage of street occupied per square mile of area of supply, it is found that the municipalities again excel. But this test is also open to criticism, for in a rural district there is no need of mains and yet the area is included upon a par with the most densely settled districts. However, Table 49 indicates with allowances for possible inaccuracies that the municipalities are fully as progressive as regards extensions and the laying of mains and possibly more so than the companies.

TABLE 49. MILEAGE OF MAINS, POPULATION AND AREA.

Undertakings.	*Mileage of Mains (H 5).*	*Mileage of streets occupied, est.*[1]	*Population per mile of street occupied.*	*Mileage of street occupied per sq. mi. of area of supply.*	*Population sq. mi. of area of supply.*
Birmingham ...	740	700	1,143	5.83	6,667
Glasgow	900	480	2,083	4.90	10,204
Manchester	858½	460	1,631	9.68	15,792
Leicester	251½	130	1,923	1.52	2,916
Municipalities..	2,749½	1,770	1,581	5.04	7,972
London—So. M.	1,162	700	2,143	12.73	27,273
Newcastle	648	350	1,486	2.72	4,047
Sheffield	538½	270	1,741	2.00	3,481
Companies	2,348½	1,320	1,886	4.14	7,818

Manufacturing Equipment.

A full description of the manufacturing and distribution systems of all undertakings examined appears in Schedule III, inquiry H 4. Only a summary need be given here. All plants were adequately ventilated and in good condition (H 74 and 77). In all there was a chemist and a laboratory at each works, a drafting room was maintained, analyses of materials frequently made and distillation tests carried on (H 29-31, 93). Maps of the street mains were complete in every case, except at Newcastle, where the records prior to the last seven years were imperfect (H 59).

So far as relates to the relative efficiency of the plants and the extent to which they are up-to-date, one naturally would expect that the old works would not be as modern nor as efficient as those recently constructed, and such is the case. Each of the municipal undertakings except Manchester is said to have had one works of a somewhat antiquated type, and this was also true of the Newcastle and Sheffield companies. The South Metropolitan company has six plants; the new large works at East Greenwich

[1] The mileage of mains (column 1) does not represent the mileage of streets served, because the mains are often laid under the sidewalks and two lines to a street. In column 2 the mileage of the streets is estimated from the data available. The figures in the other columns are computed upon the basis of column 2—mileage of streets served.

are modern and up-to-date in all respects, but three and part of a fourth are old fashioned and antiquated. Thus it would seem that the municipal plants as a group evidence as progressive management as the companies, especially when it is remembered that in only one instance—Manchester—has the undertaking been under municipal control from the start. In the three other cases the undertakings were purchased from companies and certain of the criticisms now made are due to mistakes committed by the old companies. It is worthy of special notice that the one undertaking which comes in for practically no criticism at the hands of the engineers is Manchester—the only one which has been public from the start. One would naturally expect, if public management is so unprogressive and shiftless, that this undertaking would be almost worthless as a result of 90 years of municipal operation. But about the only criticism that has been made is that the Rochdale Road works are rather crowded and that the works are not all alike. As to the former, the engineers report that improvements are under way; and the latter will be considered by many as evidence of progressive management which believes in trying out all new methods and inventions (see H 4, 73). As Parliament would not authorize a bond issue for a water gas plant, it was built out of earnings. The street mains are cast iron with turned and bored joints, and in many cases laid in concrete—a method which is criticised by Mr. Clark, but it is probably very economical in the long run for the leakage is very low.

Turning to Birmingham, one finds that all of the four plants now being operated had been started by the companies prior to purchase by the municipality. Three are said to be poorly planned, but this is due in part to the bad arrangement adopted by the old companies; to change it now would involve such an expense that the saving—not large in any case—would be wiped out by the cost of the alterations. The smallest works is somewhat antiquated and will need to be reconstructed soon, although it is said that the cost of manufacture is only very slightly in excess of the other plants. In 1904 a retort house was erected which has not yet been equipped, as the consumption of gas has not increased as rapidly as was expected and as a better quality of coal is being used, which gives a larger yield of gas, requiring fewer retorts. Coal is stacked in the open at three of the works during part of every year, but the engineer in charge maintains that there is no material depreciation—not enough to pay for the erection of coal stores.

The Glasgow works have been practically rebuilt since the undertaking was acquired by the city, except one works, which is soon to be dismantled. The large amount of gas unaccounted for indicates an inferior system of mains and services. Great improvement has been made since municipalization, however, for even in 1874-5, after reconstruction had been begun, nearly 20 per cent. of the gas made was lost. By 1884-5, the amount had been reduced to less than 11 per cent., and in 1904-5 it was 8.71 per cent. Not all of the services and mains have yet been relaid, but as fast

as opportunity arises, the faulty ones laid by the companies when competition was rampant (see A 5-8) are being replaced. Otherwise the Glasgow undertaking is modern, efficient and open to no important criticisms (see H 4).

Leicester has two works, one built by the old company, the other by the city, although the sites of both were selected by the company. The former has no railway connections and all materials have to be carted to and from the works—a defect for which the municipality is in no way to blame. There are two other criticisms, viz., that the works constructed by the municipality are too elaborate, too artistic and spread over too much ground; and that there is an absence of labor-saving devices which unduly increases cost of production. Regarding the first, there is room for a difference of opinion. No complaint was made in Leicester of the unwise expenditure of money for pleasing buildings; upon the contrary, the people expressed pride in the attractiveness of the plant, which is a model of neatness. Further, the city is now built up to it, the neighborhood has become a residential district and it is quite fitting and proper that the works should be in harmony with the surroundings instead of contaminating the whole neighborhood.

The question of hand charging and drawing and the handling of coke by hand instead of by machinery has been much discussed within and without Leicester. Mr. Colson, the engineer, maintains that in view of the excellent relations which exist between the management and the employees, in view of the cost of installing machinery for charging, drawing and handling of coal and coke and the fixed charges which would have to be paid upon the capital invested, in view of the present railroad facilities for placing cars about the works, in view of the local demand for large-sized coke and not broken, and in view of the low cost of manufacturing wages, it would be a mistake to introduce machinery. He also admits that although he is satisfied with the results he obtains from hand labor, other undertakings might find it unsatisfactory, and that if labor troubles should arise, he would doubtless proceed to adopt machinery at once in order to avoid dependence upon laborers. It should be noted also that the charging is not by shovels, but by scoops, which are more easily handled and give better results. As already seen, the results obtained at Leicester are such as to give considerable weight at least to what Mr. Colson says, and it is certain that machinery has not been introduced because of any lack of progressive management. In all other regards the plant is right up-to-date and Mr. Colson is the originator of several new processes and inventions.

The South Metropolitan company has older and more antiquated works than any other undertaking; it also has one works that is as well equipped and possibly better equipped than any other seen. But with the exception of this new works and part of another, the plants are more or less congested and behind the present state of the gas industry. Several retort houses are charged by hand and the coke is removed in the same way. If, therefore, Leicester is to

be censured for the failure to introduce charging machinery, the South Metropolitan would come in for its share (see H 4).

The Newcastle company has two works in operation. The newer one is apparently open to no criticism. The older one, opened in 1859, is said by the engineers to be antiquated and poorly arranged. The retort settings are of an inefficient type, and are to be replaced in a few years. The arrangement of the condensing, scrubbing and purifying plant is poor and unsystematic; the purifying boxes are deficient in capacity to nearly 50 per cent. (see H 4).

One of the works of the Sheffield company has no railroad connections, all of the materials being carted to and from the plant. All of the retorts here are fired by hand, and the method of handling coal is antiquated and costly. Another plant has no coke handling machinery and is very deficient in storage capacity for coke. In other respects the undertaking is modern and efficient, and the mains and services are particularly good (see H 4).

From these facts, it is apparent that while each undertaking is not up to the highest standard in all regards, the municipalities as a group are about upon the same plane as the companies; at least, there are no essential differences between them. The important test, however, is not so much what sort of plant they have, but how efficiently it is managed; not whether the retorts are horizontal, inclined or vertical; not whether the purifiers are orthodox or unorthodox; but whether the results obtained are up to standard. Further, local conditions—kind of coal, demand for by-products and use of gas—and sometimes the personal factor may enable one engineer under one set of conditions to obtain the best results from a certain kind of equipment, while another engineer with different conditions may find that apparatus not the most efficient. The consumer, the taxpayer, and the shareholder, are concerned far more with results than with the means of obtaining them.

OPERATING EFFICIENCY.

Many topics have already been discussed which touch upon operating efficiency, as for example, quality of gas, character of service, extent of use, efforts to extend use, etc. It is unnecessary to repeat what has been said, but the reader may be reminded that it has been shown that the municipalities furnished gas of a higher candle power and greater heating capacity, that their service was as good as the companies in other directions, that the number of users was larger, although the companies were making greater efforts of a special character to increase use, and that the cost of production outside of gas materials was slightly lower.

Passing to the points which have not been discussed, one comes first to the question of leakage or gas unaccounted for. This is a good test of the care exercised in constructing the mains and services and of the attention given to meters. Table 51 shows that upon the average there is less leakage in the municipal plants per mile of mains, and what is more important, that the one plant

which has been under municipal control from the beginning is lower than any company. Glasgow has the largest loss per mile of mains, but, as has been pointed out already, this is due to the poor mains and services inherited from the private companies. The loss has been reduced about 60 per cent. since municipal purchase. Combining the leakage with the amount used at works and offices, it is found that the municipalities did not sell 7.01 per cent. of the amount made and the companies 6.41 per cent. These figures seem to conflict with the ones just given, but in reality they do not, for the municipalities have the larger main mileage relatively, which reduces the loss per mile of mains as indicated in the last colmun of Table 51.

The statistics for all of Great Britain also show the municipalities to be superior, for their loss due to leakage and gas used at works was 6.95 per cent. of the gas made and the companies 8.17 per cent. The amount per mile of mains was 359 thousand cubic feet for all municipalities and 489 thousand cubic feet for all companies, a still greater difference, which is due again to the larger number of miles of mains which the municipalities have. It should be noted that the difference between all the municipalities and all the companies is more than the difference between the four municipalities and the three companies—a fact which goes to show that the municipal plants selected for extensive examination are not the only good instances of municipal operation.

TABLE 51. LEAKAGE AND CONSUMPTION AT WORKS.

	Gas unaccounted for.		*Gas used at works and offices—*	*Total used at works and unaccounted for.*	
Undertakings.	*Per mile of mains M. cu. ft.*	*Percentage of amount made.*	*% of make.*	*% of make.*	*Per mile of mains —M. cu. ft.*
Birmingham	464	5.17	1.52	6.69	601
Glasgow	624	8.71	1.03	9.74	698
Manchester	168	2.88	1.67	4.55	266
Leicester	344	4.50	.83	5.33	409
Municipalities	413	5.67	1.34	7.01	510
London	487	4.40	1.18	5.58	617
Newcastle	505	10.05	1.21	11.26	566
Sheffield	191	3.51	1.15	4.66	254
Companies	424	5.23	1.18	6.41	520

Capitalization.

It is often asserted that municipalities are wasteful and extravagant, and that large sums are spent for the erection of plants where a less expensive equipment would suffice. It is difficult to get conclusive evidence upon this point. But comparing the appraisals made by the engineers with the capacity of the plants *in toto* and for certain of the more important items, it appears in Table 52 that upon certain points the municipalities excel com-

panies, upon others the companies excel the municipalities, but all in all (col. 1) that the appraisal for the municipalities is less than that of the companies, the former being £75.73 per thousand cubic feet of daily capacity and the latter £79.29. The difference is not great and does not warrant the conclusion that the companies have been extravagant, but it does indicate that the municipalities have been as careful in constructing their plants as the companies. The low appraisal of the Leicester plant for coal gas manufacturing plant is due largely to lack of machinery for firing retorts, handling coke, etc. If this item were increased to place it upon a par with the other plants, the total would be increased slightly.

TABLE 52. APPRAISAL AND CAPACITY.

Undertakings.	*Total Appraisal per M. cu. ft. of daily capacity.*	*Appraisal of coal gas man. plant per M. of coal gas capacity.*	*Appraisal of holders per M. of holder capacity.*	*Appraisal of Bldgs. per M. man'f'g capacity.*	*Appraisal of other station equipm't per M. of man'f'g capacity.*
Birmingham	£65.28	£11.75	£11.99	£8.09	£5.09
Glasgow	77.02	9.71	13.13	10.09	4.93
Manchester	93.73	10.52	15.39	10.41	5.48
Leicester	71.60	5.41	16.72	12.45	4.20
Municipalities	£75.73	£10.03	£13.58	£9.72	£5.83
London	£73.56	£9.50	£8.95	£12.84	£3.21
Newcastle	101.42	10.33	15.54	12.09	4.43
Sheffield.....	80.02	8.57	12.67	10.58	4.67
Companies	£79.29	£9.46	£11.06	£12.31	£3.67

The Parliamentary returns for the whole of Great Britain show that all the municipalities have paid up and borrowed capital (not deducting amount repaid) of 145.3d. per thousand cubic feet of gas made, whereas the companies had 185.3d. per thousand. When it is remembered that the capital paid up and borrowed by the municipalities includes premiums paid to private companies at time of purchase, the difference in favor of the municipalities in spite of this fact becomes more and more significant.

Yield of Gas and Residuals.

One of the most common tests of operating efficiency is the amount of coal gas obtained per ton of coal carbonized. Naturally a great deal depends upon the kind of coal used, the amount of enriching and the candle power of the gas produced. These conditions vary so greatly that definite conclusions of a positive character are impossible, but it is clear that the companies do not get an appreciably larger yield, all things considered. The amount of residuals produced per ton of coal carbonized is another standard. Apparently the municipalities are doing fully as well as the companies.

Regarding a considerable number of minor matters, the engineers were asked to report the conditions that obtained. Summarizing their replies, it is found that there is practically no dif-

ference between public and private plants (see H 31, 51, 52, 88-95).

PROGRESS.

Whether public or private management is more favorable to progress and the introduction of new inventions is a most important question, but one difficult to answer fully. Certain facts have already been established which throw some light upon it. For instance, it has been seen that the municipal plants are as modern, as efficient and as fully up-to-date as the company undertakings. As the former have been operated by public bodies from 30 to 90 years, it must be true that municipal management is progressive, otherwise the present condition of the works would reflect the lack of progress. It has also been shown that the municipal undertakings yield good results, viewed from the standpoint of operating efficiency. If the public plants were not modern and if the managers were not conversant with new methods and inventions, this would not have been possible. Likewise the service, which is better under municipal operation than private, all things considered, would have been influenced. Thus throughout the long list of subjects already treated; the success of municipal management which has been shown could not have been obtained if the municipalities had been less progressive and less ready to adopt new processes and inventions than the companies.

In a number of instances the municipalities have been even more progressive and energetic in adopting improvements. The Leicester undertaking was the first to push with vigor the use of the gas stoves by renting them at a low figure to consumers. At the close of 1880, there were only 363 stoves on hire in Leicester; the present number is nearly 45,000. The example of Leicester has since been followed by many municipalities and companies, but, generally speaking, municipalities have more widely adopted the policy of renting stoves than companies. The same is true of free meter rentals, in which the public undertakings have been more progressive than companies. Further, the municipal plants of Manchester and St. Helens are the only ones in Great Britain that supply cookers free.

There is considerable difference of opinion regarding the efficiency of inclined retorts, but it is certainly an evidence of progress when one finds that the municipalities have experimented as widely, and perhaps even more widely, than the companies. It is also suggestive to learn that of the undertakings selling over 400,000 thousand cubic feet of gas during the year 1905 or 1905-6, the municipalities made relatively twice as much carburetted water gas as did the companies.

ELECTRICITY SUPPLY—GREAT BRITAIN.

A comparison of the results obtained by the public and private electric plants in Great Britain is not so conclusive as to the success or failure of municipal operation in general as in the case of gas works. Many factors come up for which allowances must be

made, and the plants selected are not always comparable. Outside of London the public and private plants are not equally distributed as to size, nearness to coal supply or local demand for current. Neither public nor private operation has been tried as long as in gas. All companies are operating under limited-term franchises, varying from 24 to 42 years, and at the expiration of these periods the municipalities may acquire each undertaking at the then value of the physical property as a going concern, but without reference to past or future profits, good will, franchises, compulsory purchase, etc. (See D 8, Electricity.) [1]

The importance of this last factor should not be overestimated for several reasons, although it is frequently used to excuse and explain why the private companies have not surpassed the municipalities. Firstly, municipalities which supply current outside of their own areas are usually in the same position toward these suburban districts that the companies occupy; that is, the outside local authorities may take over the undertakings in their areas upon the same terms as if the plants belonged to companies. In the case of Manchester, these local authorities may purchase at the end of 21 years from the date of agreement.

Secondly, the terms of purchase provide for compensation as a going concern (consideration being given "to the circumstances that they are in such a position as to be ready for immediate working") to be fixed by arbitration. As it is generally believed that companies ought not to capitalize their franchises when they pay nothing to the authorities for them, these terms must be considered fair, especially where the franchises run for 42 years from the date of the grant.

Thirdly, even supposing that the price fixed by arbitration would not be equal to the value of the undertaking as a going concern, which is the limit of capitalization that any undertaking—public or private—ought to be allowed, the private companies are not under as harsh restrictions as the municipalities. The latter are required either by special act or by order of the central administrative authorities to pay over annually into a sinking fund such amounts as will provide for the repayment of all loans at the end of certain specified periods, usually ranging from 5 to 30 years and having an equated value of from 20 to 25 years. If a private company were to follow the same plan, it would not be obliged to provide a sinking fund for a period shorter than the length of its franchise, which is ordinarily much longer than the periods just named. As a matter of fact, the companies examined by the experts have accumulated sinking or reserve funds only to pay the premiums for the redemption of stock, varying from 5 to 25 per cent. of the face value of the shares.

The investigation planned by the Committee comprehended a thorough examination of a few selected undertakings by expert

[1] All the references in the following pages upon electricity supply are to the inquiries in the reports of the experts upon this subject in part II., volume II., schedules I.-IV.

ference between public and private plants (see H 31, 51, 52, 88-95).

PROGRESS.

Whether public or private management is more favorable to progress and the introduction of new inventions is a most important question, but one difficult to answer fully. Certain facts have already been established which throw some light upon it. For instance, it has been seen that the municipal plants are as modern, as efficient and as fully up-to-date as the company undertakings. As the former have been operated by public bodies from 30 to 90 years, it must be true that municipal management is progressive, otherwise the present condition of the works would reflect the lack of progress. It has also been shown that the municipal undertakings yield good results, viewed from the standpoint of operating efficiency. If the public plants were not modern and if the managers were not conversant with new methods and inventions, this would not have been possible. Likewise the service, which is better under municipal operation than private, all things considered, would have been influenced. Thus throughout the long list of subjects already treated; the success of municipal management which has been shown could not have been obtained if the municipalities had been less progressive and less ready to adopt new processes and inventions than the companies.

In a number of instances the municipalities have been even more progressive and energetic in adopting improvements. The Leicester undertaking was the first to push with vigor the use of the gas stoves by renting them at a low figure to consumers. At the close of 1880, there were only 363 stoves on hire in Leicester; the present number is nearly 45,000. The example of Leicester has since been followed by many municipalities and companies, but, generally speaking, municipalities have more widely adopted the policy of renting stoves than companies. The same is true of free meter rentals, in which the public undertakings have been more progressive than companies. Further, the municipal plants of Manchester and St. Helens are the only ones in Great Britain that supply cookers free.

There is considerable difference of opinion regarding the efficiency of inclined retorts, but it is certainly an evidence of progress when one finds that the municipalities have experimented as widely, and perhaps even more widely, than the companies. It is also suggestive to learn that of the undertakings selling over 400,000 thousand cubic feet of gas during the year 1905 or 1905-6, the municipalities made relatively twice as much carburetted water gas as did the companies.

ELECTRICITY SUPPLY—GREAT BRITAIN.

A comparison of the results obtained by the public and private electric plants in Great Britain is not so conclusive as to the success or failure of municipal operation in general as in the case of gas works. Many factors come up for which allowances must be

made, and the plants selected are not always comparable. Outside of London the public and private plants are not equally distributed as to size, nearness to coal supply or local demand for current. Neither public nor private operation has been tried as long as in gas. All companies are operating under limited-term franchises, varying from 24 to 42 years, and at the expiration of these periods the municipalities may acquire each undertaking at the then value of the physical property as a going concern, but without reference to past or future profits, good will, franchises, compulsory purchase, etc. (See D 8, Electricity.) [1]

The importance of this last factor should not be overestimated for several reasons, although it is frequently used to excuse and explain why the private companies have not surpassed the municipalities. Firstly, municipalities which supply current outside of their own areas are usually in the same position toward these suburban districts that the companies occupy; that is, the outside local authorities may take over the undertakings in their areas upon the same terms as if the plants belonged to companies. In the case of Manchester, these local authorities may purchase at the end of 21 years from the date of agreement.

Secondly, the terms of purchase provide for compensation as a going concern (consideration being given "to the circumstances that they are in such a position as to be ready for immediate working") to be fixed by arbitration. As it is generally believed that companies ought not to capitalize their franchises when they pay nothing to the authorities for them, these terms must be considered fair, especially where the franchises run for 42 years from the date of the grant.

Thirdly, even supposing that the price fixed by arbitration would not be equal to the value of the undertaking as a going concern, which is the limit of capitalization that any undertaking—public or private—ought to be allowed, the private companies are not under as harsh restrictions as the municipalities. The latter are required either by special act or by order of the central administrative authorities to pay over annually into a sinking fund such amounts as will provide for the repayment of all loans at the end of certain specified periods, usually ranging from 5 to 30 years and having an equated value of from 20 to 25 years. If a private company were to follow the same plan, it would not be obliged to provide a sinking fund for a period shorter than the length of its franchise, which is ordinarily much longer than the periods just named. As a matter of fact, the companies examined by the experts have accumulated sinking or reserve funds only to pay the premiums for the redemption of stock, varying from 5 to 25 per cent. of the face value of the shares.

The investigation planned by the Committee comprehended a thorough examination of a few selected undertakings by expert

[1] All the references in the following pages upon electricity supply are to the inquiries in the reports of the experts upon this subject in part II., volume II., schedules I.-IV.

engineers, accountants, statisticians and economists. The municipal plants selected were those of Manchester, Liverpool, Glasgow and the Borough of St. Pancras, London. The first named is the largest municipal undertaking in Great Britain. The second and third were necessarily chosen because they supply current to the Liverpool and Glasgow municipal tramways, which were selected by the Committee. The fourth is the oldest municipal undertaking in London, and it was considered important that the experts should examine at least one London municipal plant.

The companies selected were the Newcastle Supply company, the Newcastle District company and the four London companies—City of London, Westminster, St. James and Central. The two Newcastle companies are the largest companies outside of London. The City of London company is the largest company in London. The Westminster is next in size, and having made this selection, it was necessary to include the St. James and Central companies because of the intimate relationship existing between the three. The Central company is not a distributing company, but is owned by the Westminster and St. James companies, to whom it sells all of its current at cost.

The municipal undertakings are much more representative of the entire number than the company plants. According to the computations for the years 1906 or 1905-6 made in the *Electrical Times* (May 2, 1907), a technical journal of high standing, the three municipal plants outside of London ranked tenth, nineteenth and twenty-seventh in the list of municipal plants having the lowest cost per unit sold. St. Pancras was eighth among sixteen London municipal plants. The two Newcastle companies are the lowest companies in Great Britain, and of the thirteen London companies, the ones selected ranked respectively first, fourth, eighth and tenth out of fourteen. If municipal undertakings standing as near the top of the list as the companies had been selected, the comparison would be much more favorable to municipal operation. The four chosen are not the best instances of municipal operation, nor are they the only ones that have been successful.

Municipal Purchase.

Of the four public electric supply plants specially studied by the experts, two—Manchester and St. Pancras—were municipal from their origin. Glasgow bought out a private company soon after it started and later purchased a suburban company, but as both were very small and the price paid was approximately the structural value, this also may be said to have been a municipal plant from the beginning. Liverpool is the only one of the four where a company had been in operation for several years and was taken over upon the payment of a large premium like the gas companies. The price was £400,000, and as the balance sheet of the company showed an original investment of nearly £265,000 the city paid at least £135,000, and probably about £150,000," more than the structural value of the property transferred. Liverpool thus began

operation upon July 1, 1896, eight years before the year dealt with in this report opens, with an excess of liabilities over assets of £150,000, or 35 per cent. of the price paid. (See A 4, 5-8, Electricity schedules for details.) The other undertakings, public and private, naturally started with capitalization equal to structural value.

TABLE 61. ASSETS AND LIABILITIES.

Undertakings.	*Appraisal. of assets.*	*Present liabilities.*[2]	*Deficit.*	*Liabilities per £100 of assets.*
Manchester	£1,951,734	£2,075,082	£123,348	106.3
Liverpool	1,533,165[1]	1,675,928	142,763	109.3
Glasgow	1,215,341	1,215,466	125	100
St. Pancras	469,363	471,078	1,715	100
Municipalities	£5,169,603	£5,437,554	£267,951	105.2
Newcastle—Supply	£1,166,204	£1,240,270[3]	£267,951	105.2
Newcastle—District	447,314	468,934[4]	21,624	104.8
London—City	1,766,339	2,936,286[5]	269,947	115.3
Westminster	1,143,082	1,068,578	*74,504*	93.5
St. James	539,977	487,095	*52,882*	90.2
Central	468,394	498,367[6]	29,973	106.4
Companies.	£5,531,310	£5,799,534	Net. £268,224	104.9

The present financial condition of the undertakings is reflected by a comparison of the present appraised value of the assets and of the liabilities, given in Table 61. The appraisal of the physical property of private as well as public undertakings was made by the engineers, Mr. Winchester and Mr. Klumpp. The principles fol-

[1] The appraisal of the engineers did not include an appraisal of the land because of the lack of adequate data, but I have estimated it at £70,000 or about 5 per cent. of the total appraisal. In the other cases the land ran from 4 to 10 per cent., and the opinion of everyone consulted is that £70,000 is probably considerably less than the real value, in view of the prominent location of the land.

[2] The liabilities are given at par in all but four instances, where loans have been issued redeemable at a premium. In these cases the premium has been computed and added to the par value of the debentures as stated in the following notes.

[3] The debenture stock of the Newcastle Supply company is redeemable at 105 (J 3). As £250,000 have been issued, this means a premium of £12,500, which has been added to the par value of the real liabilities given under K 1 to produce the figures here used

[4] The debenture stock of the District company—£150,000—may be redeemed after July 1, 1910, at 105 (J 3). With interest at the rate of 4 per cent., the amount of the obligation upon Dec. 31, 1905, would be nearly £6,300. Adding this to the par value of the real liabilities given under K 1, the figure of £468,938 is secured.

[5] The City of London company has issued £400,000 of debentures, redeemable at 125 after 1910 (J 3). With interest at the rate of 4 per cent. the value of this obligation upon Dec. 31, 1905, would be about £82,000, which, added to the par value, gives total liabilities of £2,036,286.

[6] The Central company may redeem its debentures—£336,876—at 110 at any time (J 3), which increases its liabilities £33,500 approximately. This amount is included in the figures here given.

lowed were similar to those adopted by the gas engineers (see pages 195-6) and did not include an appraisal of franchises, prospective profits, monopoly rights, etc. In strict propriety, they should have included expenses of organization and Parliamentary costs, but the difficulty of making an accurate estimate of these items led the engineers to omit them for all undertakings, thus placing all upon equal footing.

If to these appraisals (H 7), the "Other (live) Assets" reported by the accountants (under K 1, 2) are added, the total will be the present worth of each undertaking, exclusive of franchises, etc., as given in Table 61, column 1. This total should be compared, of course, with the present liabilities outstanding, including stocks, bonds and other real liabilities, but not including the book liabilities or surplus funds, which the undertaking would not be called upon to pay if liquidation should take place at once. Comparing these items it is found that in two municipal undertakings the assets are practically equal to the liabilities, that two have a small deficit, that four companies have a deficit, that two have a surplus, and that the total deficit of the companies is practically the same as that of the municipalities. In other words, if all the undertakings were sold to-day at the present structural value of their physical assets, if all accounts were closed, and if all liabilities were paid, the municipalities and the companies would each be short, as a group, £268,000 approximately. The municipalities have £105.2 of liabilities and the companies £104.9 for every £100 of assets. But lest the reader should jump to the conclusion that each has lost money, let him recall that the appraisal of assets does not include franchises. Each undertaking has valuable rights in the streets which would bring large sums of money if put up for sale. Further, the mere fact that liabilities exceed assets does not indicate that the plants are in an unsound condition or that the dividends declared have not been earned.

Depreciation.

Before attempting to draw conclusions from the above facts, it may be well to state just how these surpluses and deficits were accumulated. The engineers state that each undertaking was in good condition and that the works had been kept in repair (H 65-67), so that in no case could the deficit have arisen from a failure to spend a sufficient amount for maintenance and repairs, but as will be seen it did arise in most cases from a failure to set aside sufficient for depreciation in one way or another. In the case of Glasgow and St. Pancras, there is no deficit to be explained. Liverpool started in 1896 with a deficit of £150,000 or thereabouts; it has remained practically unchanged. Manchester started even, but apparently has not made adequate provision for depreciation. It is the only municipal plant where the difference between assets and liabilities is greater now than at the start, and where there has been a depreciation unprovided for of £123,000. The deficits of the four companies are due to the following:

	Redemption premium.	
Newcastle Supply	£12,500	£61,500 depreciation
Newcastle District	6,300	15,300 depreciation
City of London	82,000	188,000 depreciation
Central	33,500	*3,500 gain*
Total	£134,300	£261,300 depreciation

The surpluses of the Westminster and St. James companies are due to their generous provisions for repairs, maintenance and depreciation. Each has built up its plant to a slight degree out of earnings.

It goes without saying that each undertaking, public and private, should have kept its liabilities equal to or less than its real assets, but to what extent Liverpool should have provided for the wiping out of the "water" which was in its capitalization at the time of purchase is a debatable question, especially in view of the fact that the plant has only been runnng ten years, and that these ten years in the electrical industry have seen so many changes that the charges for *current* depreciation have been heavy. Three of the companies, like Manchester, have not provided sufficiently for depreciation, although they have kept their plants in repair. Two other companies have provided more than enough, and the sixth is about even.

The subject of depreciation is a much debated one. Various means have been adopted by the undertakings here considered for meeting it. Even those which are in the best condition have not followed the same plan (for details see I 27 and K 5, Electricity). About the only conclusion which may safely be drawn is that the means are not so important as the results, and that the only sure way of determining whether adequate provision is being made for depreciation of every description, as well as for current maintenance, repair and renewal charges is a comparison of assets and liabilities based upon an appraisal of each. This subject was more fully discussed in the section upon gas works above, to which the reader may refer (see pages 198-200).

From Table 62 it appears that the deficit of the municipal undertakings is equivalent to .071d. per unit sold and that of the companies (net) .072d. per unit for the whole period of operation. The municipal undertakings paid an average of .089d. per unit sold to relieve taxation, and if this amount had been used to offset depreciation, the plants would have had a surplus equivalent to £12,581, or .018d. per unit sold. The companies upon the other hand contributed nothing in aid of taxation, so far as the records of the undertakings show (K 5). If depreciation had been completely provided for by each group, the companies would have had to increase prices .072d. per unit or reduce dividends by that amount, and the municipalities would have had to increase prices by .071d. per unit or reduce the contributions to taxation by that amount. Thus the only difference between the two groups is that the companies paid too much to their stockholders, and the municipalities

too much to their taxpayers; in each case the consumer was benefited about to the same degree, speaking of the plants as two groups, but the plants varied, as shown by Table 62.

TABLE 62. DEFICITS AND CONTRIBUTIONS TO TAXATION.

			Deficit end of 1905.[1]		*To relieve taxation.*	
Undertakings.	*Years operated.*	*Average annual consumption—units.*	*Amount.*	*Annual average per unit.*	*Amount.*	*Annual average per unit.*
Manchester	12	9,900,000	£123,348	.242	£52,964	.107
Liverpool	90	16,933,591	.....	...	66,585	.105
Glasgow	13	5,740,199	125	...	.....	...
St. Pancras	14	2,630,000	1,715	.011	18,220	.157
Municipalities ..	12.0	35,203,790	£125,188	.071	£137,769	.089
New.—Supply ...	16	4,400,000	£65,566	.210	.....	...
New.—District ..	16	1,300,000	15,324	.177	.....	...
London—City ...	14	8,900,000	187,947	.362	.....	...
Westminster	15	6,450,000	*74,504*	*.185*	.....	...
St. James	17	3,500,000	*52,882*	*.213*	.....	...
Central	3	5,306,307	*3,527*	*.053*	.....	...
Companies	14.9	29,856,307	£133,924	.072	.....	...

The statistics for the current year, set forth in Table 63, throw still further light upon financial conditions and policies. In this table an attempt has been made, as in the case of gas, to segregate the expenditures which go to benefit the community, whether directly or indirectly. Now, it may be said that while all expenditures upon plant or for the reduction of liabalities in the case of public undertakings are undoubtedly for the benefit of the public, in the case of private undertakings they belong to the companies and are not the property of the public in any sense. This is undoubtedly true, for while such expenditures do make it possible to lower prices by making the plant more efficient or by reducing the fixed charges, the gain therefrom may go to the stockholders where there is a private company. This is especially true of electricity supply companies, for there is no limit upon dividends. However, in order to compare municipalities with companies and to ascertain what amounts were being set aside to keep up the plants, to meet depreciation and to retire liabilities, even payments to reserve funds, which are not strictly for this purpose in the case of companies, are

[1] The total amounts here given differ from those in Table 61 in that the deficits due to municipal purchase (Liverpool) and redemption premiums (four companies) have been deducted; so that these deficits (and surpluses in three cases—italics) are the direct result of the failure to provide sufficient amounts for depreciation. If the total deficits had been taken the amounts would have been increased, but the relative standing of the two groups would not have been materially altered. The exact amount of the premium paid by Liverpool is uncertain, but I have considered it here as equivalent to the present excess of liabilities over assets, although it was probably more.

included in division "A," Table 63. From the figures there given it appears that the municipalities set aside almost twice as much as the companies for these purposes during the year under review. The amounts spent by the two Newcastle companies are peculiarly small; no municipal plant even approaches them.

Under division "B" an attempt is made to find what went to relieve the taxpayer, including the lower charges for public lighting, after deducting what should have been paid to the city for the services of the general city officials. It appears that while there was great difference between the plants, the amount reaching as high as .386d. per unit in the case of St. Pancras, the average for the public plants was over three times as much as that for the private companies.

As to rates and taxes, which are largely beyond the power of companies and municipal undertakings to determine, it should be noted that the statutes recognize no difference; all are to be taxed and rated alike. As a matter of practice there are differences, and the expenditures under "C" reveal that the companies pay less local taxes than the municipal plants, although as shown in the special report on taxation, the rate of taxation is less where there are public than where there are private plants and the valuations are higher. The income tax payments are considerably more for companies, due in part to the fact that in Liverpool the assessment had been appealed and no tax was paid.

The total expenditures for "A," "B" and "C" were 1.102d. per unit sold for the municipal undertakings and .683d. for the companies, or 1.062d. and .652d. respectively, if the estimated receipts are omitted; that is, the municipalities set aside almost twice as much in the way of "community contributions" as the companies.

Notes relating to table on page 238.

[1] Transfer from reserve fund to allow dividends to be kept up.

[2] As the Central company is owned by the Westminster and St. James companies and sells all of its output to them at practically cost almost in the exact ratio of 2 to 1, and as the current thus supplied is resold by these two companies and appears in their sales, the expenditures of the Central company are divided in the ratio of 2 to 1 between these two companies and are not given separately here.

[3] The items opposite this heading relate to street lighting. It will be seen when we come to the receipts from public lighting that the undertakings charge various rates ranging from 1.8d. per unit to 3d. In order to make comparison easy, I have assumed that 3d. is the normal figure, including care and maintenance (which is doubtless too high). Adding .5d. per unit for such care, etc., where the prices did not include it, and deducting these amounts from 3d., the indirect contribution of each undertaking is thus obtained, which multiplied by the number of units sold for street lighting and divided by the total sales, gives the amounts appearing in this table.

[4] An appeal from the assessment was pending and the tax had not been paid.

[5] These are the amounts levied upon the undertakings, but collected from the holders of securities. Hence the amounts given in Table 64 as payments for interest and dividends are the net amounts the holders received, equivalent to the figures given under M 2, less the corrections given in this table. See also Note [5] to Table 64.

TABLE 63. COMMUNITY CONTRIBUTIONS FOR THE YEAR 1905 OR 1905-6.

(Pence per unit sold.)

A. Maintenance, repairs, etc. (L 4)—	*Manchester.*	*Liverpool.*	*Glasgow.*	*St. Pancras.*	*Municipalities.*	*Newcastle Supply.*	*Newcastle District.*	*London—City.*	*Westminster.*[2]	*St. James.*[2]	*Companies.*
Generation	.085	.050	.055	.170	.073	.038	.040	.087	.149	.159	.085
Distribution	.132	.018	.143	.133	.094	.061	....	.065	.035	.067	.054
Depreciation fund (M 3)	....	....	.516	.016	.106	.098	....	.028	.563	.557	.206
Renewals accounts (M 3)	.273	.100	....	....	.138	....	....	....	....	....	....
Sinking fund (M 3)	.421	.324	.203	.295	.334	....	....	....	....	....	....
Other funds (reserve) (M 3)	.032	.136	.201	.163	.112	....	[1].036	.536	.056	....	.150
A.—Total expenditures for plants	.943	.628	1.118	.777	.857	.197	.004	.716	.803	.783	.495
B.											
Receipts omitted (I 30, 41-43)[3]	.003	.004	.057	.242	.040	.005	....	.065	.133	....	.031
Expenses omitted (I 29)	.011	....	....	.036	.006	....	....	....	....	....	....
Net amount	.008	.004	.057	.206	.034	.005	....	.065	.133	....	.031
In aid of rates as reported (M 3)	....	.151	....	.180	.066	....	....	....	....	....	....
B.—Total to relieve taxation	.008	.155	.057	.386	.100	.005	....	.065	.133	....	.031
C.											
Local rates paid	.123	.120	.160	.089	.127	.033	.076	.105	.196	.279	.112
Income tax charged in accounts	.006	Note[4]	.005	.025	.005	....	.038	.063	.069	....	.030
Corrections for income tax[5]	.023	Note[4]	.018	.014	.013	.017	....	....	.008	.075	.015
C.—Total rates and taxes	.152	.120	.183	.128	.145	.050	.114	.168	.273	.354	.157
D.—Total of A+B+C	1.087	.903	1.358	1.291	1.102	.252	.118	.949	1.209	1.137	.683
E.—Total D, less receipts omitted	1.084	.899	1.301	1.049	1.062	.247	.118	.884	1.076	1.137	.652

Notes relating to this table on preceding page.

Operating Costs.

Proceeding now to analyze the other items which go to make up cost and to compare the industrial efficiency of public and private management, we find that the statistics relating to electricity supply are neither so complete nor so uniform as those for gas works. It will be impossible, therefore, to make so thorough and detailed an analysis for the electric undertakings as was made in the pages on gas. The companies and municipalities seem to have erred about equally in this respect, and probably it is due to the lack of a well recognized uniform system of records and accounts. This industry is comparatively new; changes have been made so rapidly and conditions have been so unstable that adequate attention has not been given this subject; but until some further steps are taken in this direction, it will be impossible to make satisfactory comparisons except upon a few points. For example, the absence of a record of the number of units generated has made it necessary to adopt *units sold* as a basis throughout, although when considering costs of generation, this is somewhat misleading.

Table 64 gives all items of expense not included in Table 63. Total "A" includes all operating costs aside from maintenance and repairs, which are given in the preceding table. As a group, the municipalities produce a unit at a cost of .633d., while it costs the companies .888d. Throughout the costs are higher for the companies than for the public plants, but this comparison is somewhat unfair and misleading, for only one of the public plants is in London, while three of the private plants are there. The cost of coal and labor is naturally more than in the provincial towns, and none of the undertakings, except possibly the City of London company, has such a large output and such a densely populated area as to offset this handicap to any great extent.

Notes relating to table on page 240.

[1] As the expenditures of the Central company, from which the Westminster and St. James companies purchased current, have been apportioned between them in proportion to their amount of current bought, the amounts paid, which were practically the cost of production, are eliminated.

[2] These amounts were transferred from the credit balance in profit and loss account.

[3] As the Central company is owned by the Westminster and St. James and sells all of its output to them practically at cost almost in the exact ratio of 2 to 1, and as the current thus supplied is resold by these two companies and appears in their sales, the expenditures of the Central company are divided in the ratio of 2 to 1 between these two companies and are not given separately here.

[4] Probably included with "wages."

[5] As explained in the special report upon Taxation, some undertakings have collected part or all of the income tax from the holders of their securities. In certain instances the whole amount levied has been shown in the accounts under the proper heading, in others it has been deducted from interest or dividends, but has not been shown in the accounts as income tax. To bring all plants to a uniform basis, where the latter plan has been followed the amounts thus collected from the holders of securities have been placed under "C" in Table 63, and subtracted from the interest for municipalities and the dividends of the companies in Table 64, so that these tables show the actual amounts and they way they were paid. See also Note [5] to Table 63.

TABLE 64. OPERATING COSTS—1905 OR 1905-6. (Pence per unit sold.)

Generation (L 4)—	*Manchester.*	*Liverpool.*	*Glasgow.*	*St. Pancras.*	*Municipalities.*	*Newcastle Supply.*	*Newcastle District.*	*London—City.*	*Westminster.*[3]	*St. James.*[3]	*Companies.*
Fuel	.260	.270	.215	.469	.269	.123	.351	.356	.575	.598	.330
Oil, water, etc.	.035	.037	.034	.049	.036	.012	.085	.015	.077	.064	.035
Wages	.088	.114	.088	.157	.109	.072	.188	.085	.178	.157	.160
Salaries	.020	Note[4]	.004	.016	.009			.139	.066		
Other	.012	....	....	.006	.004	....	....	.005	.001	.004	.002
Current purchased (L 4)	....	....	.102	....	.020	....	....	....	Note[1]	Note[1]	....
Distribution (L 4)—											
Wages	.093	.013	.027	.047	.048	.031	.031	.049	.103	.195	.078
Salaries	.010	Note[4]	Note[4]	.018	.005		.012	.044			
Other	.018	....	....	.012	.007	....	....	.002	....	....	....
General (L 4)	.088	.127	.149	.205	.120	.194	.115	.320	.411	.384	.283
Omitted general expenses	.011	....	....	.036	.006	....	....	....	....	....	....
A.—Total	.635	.561	.619	1.015	.633	.432	.782	1.015	1.411	1.402	.888
Interest (M 2)[5]	.435	.419	.484	.521	.446	.098	.191	.395	.285	.301	.238
Dividends (M 2)[5]	....	....	....	....	....	.366	.502	.722	1.194	.908	.679
Balance carried to Profit and Loss Account for next year (M 3)	....	....	.047	[2].010	.009	.004	[2].006	.004	[2].080	[2].066	[2].020
B.—Total	1.070	.980	1.150	1.526	1.088	.900	1.469	2.136	2.810	2.545	1.785
Less interest, rents and other receipts	.008	.021	....	.042	.013	.152	.003	.148	.139	.147	.140
C.—Net amount	1.062	.959	1.150	1.484	1.075	.748	1.466	1.988	2.671	2.398	1.645
Total E (Table 63), Community Contributions less receipts omitted	1.084	.899	1.301	1.049	1.062	.247	.118	.884	1.076	1.137	.652
D.—Total=To net receipts from current and meter rents (Table 71)	2.146	1.858	2.451	2.533	2.137	.995	1.584	2.872	3.747	3.535	2.297

Notes relating to this table on preceding page.

A comparison of the public plant of St. Pancras with the three private undertakings in London examined by the experts, is much more sound and scientific. Such a comparison shows that the companies pay more per unit sold for all important items than does St. Pancras, but that "Total A" for the City of London company is exactly equal to that for St. Pancras, the other two being very much higher. The lower cost of fuel per unit for the City of London company is due to its long day load and the direct delivery of coal by water, whereas St. Pancras has a light day load and supplies little current for power. In this respect it is more nearly upon a par with the Westminster and St. James companies. But all of the companies have districts which give a greater demand because of the character of the business conducted therein than St. Pancras, so that they have an advantage in this direction.

Comparing the public and private plants in the provincial towns, the first noticeable fact is the difference between the two Newcastle companies. Total "A" for the District company is considerably more than the highest municipality, and the Supply company is nearly as much below the lowest municipality. Nearly all of this difference is due to fuel, but why the District company should have spent much more than any provincial municipality when it has good, cheap coal right at its door, is inexplicable upon any ground, except that the plant has a lower efficiency and consequently a high cost per unit, even though the cost of coal per ton is small. The low cost of the Supply company for fuel is principally due to the low price of coal and the arrangement made with the Priestman Power Company which it controls, whereby the Supply company obtains the gas from the coke ovens operated by the Power company for heating its boilers in its generating station close at hand. The company refused to make known the terms of the contract, but as the gas had been allowed to go to waste, it being a by-product in the manufacture of coke, it is evident that its cost to the Supply company is very low (see H 2). It also explains partially why the expenditures for salaries and wages are low, for the labor cost of operating a power station where gas is burned is much less than where coal is used.

The conditions which prevail in Newcastle obtain in no other place visited. Coal is cheaper there than anywhere else. The demand for coke is so great that illuminating gas becomes almost a by-product, and was so treated by the Power company. Further, the opportunities for the use of electricity throughout the day in factories are equalled nowhere else in Great Britain. The magnitude of these great industries and their peculiar suitability to the adoption of electric motors is nowhere approached, except at Glasgow where neither the municipality nor the private company operating outside of the city has been able to develop the business which the Newcastle Supply company has developed. This company supplied over 11,400,000 units to one customer alone—the North Eastern Railway Company—during 1905. Over 6,200,000 units were sold in bulk to other companies, and over 9,000,000 units were

taken by 179 power consumers. Thus about 90 per cent. of the whole output was sold to between 180 and 190 consumers—a situation unmatched by any company or municipality in all Great Britain; none even approached it (see H 13).

Not only are the natural conditions in Newcastle unusually propitious, but the personnel of the management places it quite in a class by itself; it is not representative of company management generally. This fact will be brought out by a comparison of the evolution of the Supply company and the District company. Both obtained powers from Parliament at almost the same moment; both began the distribution of current in the same month; both originally had equal rights in the same area. No two companies ever started upon a more equal footing so far as outward appearances were concerned; but in 15 years the one has an output of nearly 30,400,000 units and the other upwards of 5,200,000. The former produces current at an operating cost of .531d. per unit and the latter .822d. (Total "A" plus maintenance, etc., charges, omitting taxes.) The former receives .995d. per unit; the latter 1.584d. per unit. The rapidity of growth and superiority of the Supply company is due, therefore, not to favorable local conditions alone, but in part to the character of the men who have been in charge. To assert that the explanation is to be found in the fact that it is a private company, is contradicted by the experience of the District company, of the London companies and of the whole of Great Britain, for if it is a fair sample of company management, why is it so far ahead of the others and why do not the other companies show a similar superiority? Even the District company, which has all the stimulus of keen competition and most favorable local conditions, does not show such low costs as the public plants in the provincial towns.

Capital Charges.

Coming to the second division in Table 64, the companies are found to charge over twice as much for interest and dividends as the municipal plants, the amounts being .917d. and .446d. per unit for respective groups. An examination of the figures in detail shows that the municipal plants are rather uniformly grouped around the average, Liverpool having the lowest and St. Pancras the highest, as was to be expected. The companies show a great divergence. Every London company has over twice the costs which St. Pancras has, and one almost three times as large. The Newcastle District company has a charge of .209d. per unit more than the highest provincial municipality. The Newcastle Supply company is again in a class by itself, having a charge of .464d. per unit, which is considerably below any other company, and only slightly in excess of the average for the four municipal plants.

The explanation of these conditions is two-fold. In the first place, as shown by Table 65, the present net liabilities per unit of sales is very much less for every municipality than for any company, except the Newcastle Supply company, which is almost 3d. per unit less than the lowest company. In the second place, the rate of interest for every municipal undertaking is less than the

rate of interest and dividends for any company. The former is very close to 3 per cent. for every plant, but the companies range from 3½ per cent. for the District company to 6½ per cent. for the Westminster company. (These are not the rates of dividends upon the stock alone, but the average of interest and dividends. The dividend rate is very much higher than the averages here given, for a considerable portion of the liabilities are debentures, which bear only about 4 per cent. interest.) Combining these two factors, we have the great difference shown by the per unit figures in Table 64.

TABLE 65. LIABILITIES PER UNIT OF SALES.

Municipalities.	*Amount.*[1]	*Companies.*	*Amount.*[1]
Manchester	14.78d.	Newcastle-Supply ...	9.80d.
Liverpool	12.78d.	Newcastle-District ...	21.72d.
Glasgow	15.99d.	London-City	23.32d.
St. Pancras.....	16.99d.	Westminster[2]	22.56d.
Average	14.49d.	St. James[2]	20.06d.
		Average	17.57d.

Regarding the extremely low liabilities of the Supply company, it is to be remembered that the arrangement with the Priestman Power company makes unnecessary considerable outlay that would be necessary under ordinary conditions. Further by selling over one-third of its output to a railway company and one-fifth in bulk to a few distributing companies, and another one-third to a few large power users, the capital outlay for a distributing system is reduced to a minimum—facts which again go to prove how anomalous is the Supply company and how unlike other companies.

The total called "C Net Amount" in Table 64 shows what the various undertakings have expended upon operation (less maintenance, etc., charges given in Table 63), what was paid for interest and dividends plus (or minus) amounts to (or from) profit and loss account for previous years, and what was received from miscellaneous sources. If to this total be added the community contributions, less receipts not entered in the accounts, there will be obtained the total receipts from the sales of current and meter rents, or the average price, which is considered subsequently in Table 71. It appears from "D" that the average price for municipal plants is 2.137d. per unit sold, and for companies 2.297d., or a difference in favor of municipal operation of .160d. per unit. However, if the undertakings had all been upon an equality as to community contributions (see total "C," Table 64), the average price in the municipal undertakings would have been .570d. below what the companies would have charged; or to make a fairer comparison, the St. Pancras undertaking would have been from .504d. to 1.187d. below every London company. Comparing the provincial plants, the Newcastle Supply company would have been from .211d. to .402d. below every municipality, and the District company would have been from .316d. to .507d. above.

[1] These amounts are from Table 61 and include only the real liabilities as then computed. All book accounts are omitted.

[2] See Note (²) on p. 239.

Analysis of General Statistics.

The preceding analysis of the several plants specially examined by the experts demonstrates the superiority of municipal operation in many directions. It is quite important to ascertain whether the conclusions there reached are generally true or whether they are applicable only to the ten undertakings visited.

TABLE 66—PUBLIC AND PRIVATE PLANTS IN LONDON.[1]

	Public.	*Private.*
Number	16	18
Area of supply	55.5 sq. mi.	64.5 sq. mi.
Population	2,550,228	2,225,540
Number of houses	324,492	316,061
Rateable value of property in area	£16,225,000	£26,065,000
Capacity of plants	54,157 k.w.	128,175 k.w.
Load factor	17.43%	16.30%
Units generated or purchased	53,633,987	(?)
Total units sold	42,998,318	119,546,734
(*a*) Light, power and heating	33,816,335	115,332,110
(*b*) Public lighting	9,181,983	4,214,624
Expenditure charged to capital	£5,443,524	£12,728,184
Ditto per k.w. of plant installed	£100	£99
Amounts allocated to or available for liquidation of capital exp	£407,364	£1,373,036
Ditto percentage of capital exp	7.37	10.14
Total working revenue per unit sold	3.02d.	3.37d.
Total working costs per unit sold	1.50d.	1.52d.
Gross profit on working per unit sold	1.52d.	1.85d.
Other receipts less special expenses per unit sold	.09d.	.08d.
Interest and dividends paid	.92d.	1.50d.
Redemption of loans	.43d.	.01d.
Transfers to renewals, reserve, etc., funds	.17d.	.44d.
Contributions in aid of rates	less than .01d.	.....
Transfer to profit and loss account	.09d.	*.02d.*
Average price per unit, including meter rentals and bad debts—		
(*a*) Private supply	3.14d.	3.76d.
(*b*) Traction	.....	1.48d.
(*c*) Public lighting	1.94d.	2.02d.
(*d*) Total	2.89d.	3.34d.

There are three principal sources of information: The analyses published in the *Electrical Times*, a technical journal of recognized authority on electricity supply and tramways; Garcke's *Manual of Electrical Undertakings*, edited by a well known opponent of municipal operation and a prominent official in many companies; and the *Return Relating to Electricity Supply in the County of London*, prepared by Mr. Edgar Harper, statistical officer of the London County Council, and published annually for the past few years by that body. The reports made to the Board of Trade by companies and municipalities are not printed, but the data contained therein are used in the preparation of the three works just mentioned. The summary of the principal facts in the L. C. C. *Return*, which is based upon the accounts as audited by agents of the Local Government Board for the municipal plants

[1] The statistics are for the year 1905 for the companies, and 1905-6 for the public plants.

and of the Board of Trade for private companies (both departments of the national government), appears in Table 66.

Before proceeding to point the moral of these statistics, it should be observed that the areas occupied by the private companies in London are more densely populated, have a far greater property value, and contain a much larger number of factories, shops and other buildings in which electricity would be used than the areas occupied by the public undertakings which are more residential in character (see Table 67 also). These facts largely explain the great difference in the size of the plants and their sales. One would naturally expect, therefore, that the operating costs of the companies would be very much less per unit than the public plants, but the difference is only .02d. per unit and that is in favor of the municipalities. If the latter had paid as much in rates and taxes (the rate of taxation being less where there were municipal plants), the difference would have been .07d. in their favor. Table 66 further shows that the municipalities set aside .15d. per unit more than the companies for redemption of loans, depreciation, etc., and that while the municipalities have been providing for their plants, the companies have distributed among their stockholders .58d. per unit more than the cities paid in interest. Neither group made any contributions to relieve taxation worth mentioning, and the average receipts (prices) were .35d. per unit less for the public than for the private plants. The higher percentage of capital available for liquidation is due to the fact that the company plants have been running longer than the municipal plants. Other important deductions from this table will be noted further on in the discussion.

A comparison of the public and private plants outside of London is also made by the *Electrical Times*. The summary (for the years 1905 or 1905-6) is given in Table 67:

TABLE 67—ELECTRICITY UNDERTAKINGS OUTSIDE OF LONDON.

	Public.	*Private.*
Number of undertakings	196	70
Board of Trade units sold	391,324,269	65,819,781
Average sales per undertaking in units	1,996,552	940,283
Capital expenditure at end of year	£28,884,748	£6,454,998
Capital per plant	£147,371	£92,214
Capacity of plants in k. w	405,953	72,842
Average capital per k. w. capacity	£71.2	£88.6
Average per undertaking, k. w	2,071	1,041
Capital per unit sold	17.7d.	23.5d.
Maximum load in k. w	258,102	44,773
Load factor	17.31%	16.78%
Revenue from electricity supply	£3,677,320	£576,525
Average revenue per unit sold	2.25d.	2.10d.
Revenue from meter rents and other sources per unit sold	.06d.	.21d.
Total revenue	2.31d.	2.31d.
Operating expenses per unit	1.06d.	1.18d.
Gross profit per unit sold	1.25d.	1.13d.
Percentage of gross profit to capital	7.07%	4.82%
Depreciation or sinking fund per unit sold	.47d.	.19d.
Percentage of depreciation and sinking fund to capital	2.69%	.8%
Net profit per unit sold	.78d.	.94d.
Percentage of net profit to capital	4.38%	4.00%

This summary shows several important facts. The operating expenses in the private plants per unit are higher than those of the public plants. This may be accounted for in part by the larger average size of the latter, but the many small companies are offset by the few large power supply companies, principally, the great Newcastle company, with its nearness to the coal fields and its phenomenal management. If only this one company, unique of its kind, were omitted, a still greater difference would appear. The average price charged for current is 0.15d. per unit higher in the municipal plants, but if the revenue from meter rentals and other sources is included, the receipts per unit sold become the same. The public plants put into sinking fund and renewal expenses .28d. per unit more than the private companies. In proportion to capital investments the difference is still more striking, for the public plants devote to sinking fund and depreciation charges an amount equal to 2.69 per cent. of their capital, or nearly three and one-half times as much as the private companies. The municipal plants still have left for interest and dividends, or for payment to the rates and surplus, 4.38 per cent. of their capital, as compared with 4.01 per cent. in the case of the private companies. Since the municipalities borrow in England at from 3 to 3½ per cent. ordinarily, there is available out of the municipal electric profits quite a surplus. Whether the larger capital per unit of capacity in the private plants is another evidence of their inferiority or a natural result of their small average size cannot be clearly determined. Neither does it appear whether the capital given as belonging to the municipal undertakings is before or after deduction of the accumulated sinking fund. Probably it is before deduction. If so, their financial strength is still stronger and their net capitalization per unit of capacity and of sales is still lower as compared with the private plants.

The facts given in Garcke's *Manual* for 1906 are not essentially different from those in the *Electrical Times*, but lest some should doubt the fairness of the compilations already given, the following analysis of the facts summarized in the last edition of the *Manual*, which is edited by an opponent of municipal operation, is here appended:

TABLE 68—GARCKE'S TABULATIONS FOR 1904-5.

	Public.	*Private.*
Number of undertakings	182	71
Number of units sold	356,759,088	166,101,141
Average number per undertaking	1,960,215	2,372,873
Revenue from sale of current per unit sold	2.44d.	3.12d.
Total revenue from all sources per unit sold	2.57d.	3.39d.
Total operating expenses per unit sold	1.21d.	1.59d.
Trading balance per unit sold	1.36d.	1.79d.
Bad debts and special charges per unit sold	.06d.	.03d.
Sinking fund, depreciation or reserve per unit sold	.64d.	.3d.
Net profit: For interest, investment in plant, or payment to the city by public plants: or for interest and dividends by private plants.	£989,620	£1,009,029
Ditto per unit sold	.66d.	1.45d.

From this table of Mr. Garcke's, as well as from the others, it appears that the public plants not only charge much less per unit, but have much lower operating expenses, put twice as much into sinking fund, depreciation and reserve, and do not have to pay out in interest and dividends nearly as much per unit of sales as do the private plants in order to secure the necessary capital. In a nutshell, the consumer reaps the benefit under municipal operation which goes to the stockholders under private management. These figures as thus compared are open to the criticism, however, that they unite in one computation the plants in London with those outside, where the cost of coal and labor may average less per unit. But on the other hand, Mr. Garcke's method of uniting all the municipal plants and all the private plants overcomes the handicap on the municipal plants in London on account of their smaller average size in comparison with the private London plants, and vice versa outside of London. But even by so doing, the private plants have some advantages due to the fact that their average output is larger than that of the municipalities.

Price of Service.

The rates of charge for each undertaking examined by the experts are set forth in detail under Inquiries I 2-4, Schedule IV, Electricity Supply. It is apparent at a glance that no uniform method of charge has been adopted by even a considerable number of plants. Several have adopted the maximum demand system, others charge according to the amount consumed, lowering the price per unit as the amount increases, and still others offer rates upon both principles. The greatest divergence between the highest and lowest rates seems to be in the scale of the City of London company, where they range from 8d. to ¾d. per unit (k.w.h.) The lowest price was charged by the Newcastle Supply company, about .5d. per unit to certain very large consumers. The company would not give the exact figure to the Committee, but nearly 14,000,000 units were sold at less than ¾d. (note (5) to L 2). The municipalities had no secret rates; all the charges and conditions of charge were published broadcast, and there was no opportunity for rebates or special rates. At least two of the companies made special rates to certain consumers which they would not make public.

Owing to the varying methods of charge, the only practicable way of comparing the rates of the various plants is to take the average receipts from sales of current for various purposes. But as the receipts are not fully differentiated for all plants, it is only possible to separate street lighting from sales for commercial lighting and power. The facts are given in Table 70, the figures being obtained by dividing the receipts given under inquiry L 2 by the number of units sold for the two classes under H 13.

This table shows that the average price for street lighting in the municipal plants was .529d. per unit less than that charged by the companies, including care, maintenance and trimming of lamps in all cases. As in the case of gas, high prices have not been charged by the public undertakings for street lighting to expand their re-

ceipts and make a better showing, for the average for the municipalities is less than the average for current for other purposes, while in the case of the companies it is more. It also appears that the municipalities charge considerably less for meter rents and that the average receipts for lighting, power, etc., other than public lighting are .119d. per unit less than the companies' rates. The two Newcastle companies show lower receipts than any municipality, and the London undertakings are all very much above the provincial plants. But St. Pancras, the only municipal plant in London, is considerably below any London company. That the rates for both street lighting and private use are generally lower under municipal operation has already been noted and is shown by Table 65.

TABLE 70—AVERAGE RECEIPTS—PUBLIC AND PRIVATE (PENCE).

	Lighting, Power, etc.			*Street Lighting.*		
Undertakings.	*Current.*	*Meter Rents.*	*Total.*	*Average Receipts.*	*Added for care, etc.*[1]	*Total.*
Manchester	2.143	.003	2.146	2.002	....	2.002
Liverpool	1.838	.020	1.858	2.000	.500	2.500
Glasgow	2.150	....	2.150	1.801	....	1.801
St. Pancras	2.852	.009	2.861	1.500	.500	2.000
Municipalities	2.145	.009	2.154	1.684	.270	1.954
Newcastle—Supply	.971	.019	.990	2.014	....	2.014
Newcastle—District	1.508	.055	1.563	.....	....	.....
London—City	2.788	.123	2.911	2.300	....	2.300
Westminster	3.870	.140	4.010	2.605	....	2.605
St. James	3.438	.107	3.545	3.016	....	3.016
Central	Omitted because it does not distribute.					
Companies	2.196	.077	2.273	2.483	....	2.483

Combining receipts from street lighting and sales to private consumers (dividing items given in L 2 by total units sold), Table 71 is obtained, from which it appears that St. Pancras furnishes current cheaper than any London company, but that both Newcastle companies undersell the provincial municipalities. An examination of the expenditures per unit in Tables 63 and 64 will explain how they are able to do so. In the first place, the District company made wholly inadequate provision for depreciation. Its expenditures for repairs and maintenance were far below every other plant and no undertaking could keep its works up to date and not spend more year after year. If the company had made as large "community contributions" as the least made by any public plant, its prices would have been above any provincial municipality, without allowing for the fact that it has cheaper coal than any

[1] In order to make an exact comparison the expenditures for the care, maintenance and renewals of the lamps where these expenses were borne by the city in addition to rates for current, should be added to what the city pays for current alone to place all plants upon the same basis. This is done for Liverpool and St. Pancras, being estimated at ½d. per unit—about the normal average.

plant save the Supply company. The lower price charged by the Supply company is due in large part also to the low charges covered in Table 63, which are less than any other plant except the District company, in part to the low fuel costs owing to the cheapness of coal in Newcastle and its arrangement with the Priestman Power company already referred to, in part to the small distributing system it is obliged to maintain, as it is practically a power and bulk supply company, in part to the large area outside of Newcastle it may supply, and in part, it is true, to the character of its management.

It has already been stated that the Newcastle companies, particularly the Supply (power) company, are not representative of the companies generally outside of London. Even including all the power and bulk supply companies, whose distribution costs including fixed charges as well as operating costs are very low, the average receipts of the provincial companies per unit sold are exactly equal to those of the public plants (see Table 66). The average for all of Great Britain is considerably less under municipal operation than company management (see Table 67). Further, Parliament has generally restricted municipalities to their own areas, while allowing companies to go outside. This fact has seriously hindered Glasgow and Liverpool from getting hold of the large industries along the Clyde and the Mersey rivers.

TABLE 71—AVERAGE RECEIPTS FROM TOTAL SUPPLY.

(Computed per unit in pence.)

Undertakings.	*Public Lighting.*	*Private Consumers.*	*Meter Rents.*	*Total.*
Manchester	.005	2.138	.003	2.146
Liverpool	.018	1.821	.019	1.858
Glasgow	.150	2.301	....	2.451
St. Pancras	.363	2.163	.007	2.533
Municipalities	.066	2.062	.009	2.137
Newcastle—Supply	.010	.966	.019	.995
Newcastle—District	....	1.579	.005	1.584
London—City	.149	2.608	.115	2.872
Westminster	.268	3.356	.123	3.747
St. James	.057	3.373	.105	3.535
Companies	.099	2.124	.074	2.297

Service.

Passing from price to service, the first fact to be noted is that all the undertakings now supply both alternating and direct current, although one public and two private plants did not do so until recently. The former is transmitted at high voltage (usually about 6,000) and converted into low tension direct current at substations. The latter is supplied at 240 and 480 volts or thereabouts, but Manchester also supplies some current at 110 and the St. James company generally at 120 (H 4). Manchester and both Newcastle companies use alternating current for limited service distribution.

Apparently the voltage was well maintained in all undertakings, the only case of unusual fluctuation being at St. Pancras, where there was a drop of nearly 30 volts upon two evenings, due to turbine troubles (H 23, 27).

Judging from the evidence before us, there was no difference between the municipal and the company undertakings as regards the promptness with which current was turned on (H 87) and complaints attended to (H 71, 73), the convenience of the location of offices (H 70), the testing of meters (H 17), the restoration of paving after streets were opened (H 46), the care given to street work generally (H 47-9), although there were more complaints upon this score against companies than municipalities (A 12), the construction of extensions (H 31), and the extent to which the entire area of supply was served (H 31-42) and appliances carried in stock for sale or rent (H 21). The companies, especially the Newcastle Supply company, did very much more in the way of renting motors to consumers than the municipalities; only one public plant—Manchester—has rented any. The municipalities excuse this situation by saying that it is very difficult and sometimes impossible to get authority to raise money by loans for this purpose, and that those who are opposed to municipal operation have fought the rental of apparatus to consumers and have prevented the extension of activity in a direction whereby consumption would be increased and the consumers greatly benefited. Thus, while it remains a fact that municipal undertakings do not reach out in this direction, their inactivity is due, partly at least, to artificial restrictions.

Although the municipal undertakings seem to have been as liberal and as progressive in the matter of extensions within the area of supply, they have not been permitted, except at Manchester, to go outside of their own boundaries. This has handicapped them somewhat at Glasgow and Liverpool, where there are large works which would doubtless take current in the suburbs along the Clyde and the Mersey. The Newcastle Supply company has powers in over a score of districts (A 17, 18, D 11), and sells over three-fourths of its output outside of Newcastle.

Extent of Use.

The available statistics regarding consumption in the several plants specially investigated are given in Table 72 (taken from H 16). The three London companies should not be compared with other undertakings. They supply areas which are given over principally to business and commerce. The population figures include only those who live there—the night population—and they are a very small proportion of those who have shops or offices or work there during the day. Current is used mostly for lighting offices, shops and theatres, and for power purposes in small factories. The Borough of St. Pancras is chiefly a residence district, occupied by artizans, clerks and small shopkeepers, who consume small amounts. There are some factories in the southern part, but prob-

ably the day population is less than the night. Under such circumstances, the fact that the population per service is as low as 85 and that the sales per capita are 28.3 units per year, indicates a very favorable condition of affairs.

Comparing the two Newcastle companies with the three municipal plants outside of London, it appears that Glasgow far surpasses them as regards the percentage of consumers to population, for 1 person in 60 has a service in Glasgow, whereas 1 in 87 does in Newcastle. But the Newcastle companies excel Manchester and Liverpool in about the same degree that Glasgow surpasses them. In view of the fact that there are two rival companies side by side in Newcastle, the superiority of Glasgow seems all the more remarkable, and the difference between Newcastle and Manchester and Liverpool is diminished. The Newcastle companies have avoided practically all of the evils of competition by dividing the area between them and have retained the advantages of competition by remaining in such close proximity that a constant comparison of methods, prices and character of service spurs each of them to give the better service at the lower rate.

The failure of Glasgow to supply current outside of its area has been made the basis of severe criticism. It would be much better if it did have the power to go outside, but it is not Glasgow's fault. It does not have the legal authority to do so, thanks to the very opponents of municipal ownership who condemn it for not supplying outside.

TABLE 72—CONSUMPTION OF CURRENT (UNITS).[1]

Undertakings.	*Population per Service.*	*Sales per Service.*	*Sales per Consumer.*	*Sales per capita.*
Manchester	106	2,576	2,576	24.3
Liverpool	116	1,857	1,857	16.1
Glasgow	60	1,443	1,443	24.0
St. Pancras	85	2,409	2,409	28.3
Newcastle—Supply	87	3,565	3,011	45.5
Newcastle—District		5,184	5,290	
London—City	7	2,587	1,601	381.5
Westminster	16	1,901	1,901	116.4
St. James	9	3,451	3,451	390.8

The difference between the Newcastle companies and the municipalities comes out all the more clearly when one compares the sales per consumer and per service. Glasgow, which has the largest number of users, has the smallest sales; then come the other municipal plants, with the Newcastle companies surpassing Manchester even. These facts lead one to suspect that the Newcastle companies make special efforts to get the large consumers, while the municipal undertakings pay more attention to the small

[1] Omitting all sales to street railways, steam railways and other companies to be resold outside of the area, but including all sales for commercial power.

consumers. This is clearly shown by comparing the number of power consumers with the total h. p. connected under H 8. It there appears that the average h. p. per power consumer in the three provincial municipalities being considered was 8, while in the Newcastle Supply company the average was 256. The average number of units used by the power consumers in Manchester, Liverpool and Glasgow was 3,652, 2,921 and 3,478 respectively; for the Supply company, 51,167. As already stated, over one-third of the entire output is sold to one company, one-fifth goes to a few customers in bulk and another one-third goes to 179 power consumers. Further, Newcastle sells three-fourths of its output outside of Newcastle, while Glasgow and Liverpool have no power to go outside of their boundaries. Each Newcastle company supplies only about one-half the current per capita for lighting that is supplied by the municipal plants, which convinces one that the small user is neglected by the Newcastle companies and that every energy is bent upon securing the big user, and the larger the better.

Whether this policy is a wise one, the reader must judge for himself. But it should be remembered that the large consumer, the owner of a big factory, is amply able to look out for himself ordinarily. Because of the large amount of current used he can easily establish his own power plant and generate current at a low cost. If the managers of an undertaking have any obligation to the community as a whole, it is first to look after the small user, the man who is dependent upon a common supply because of his inability to generate his own current at a reasonable rate. This the municipalities have done much more than the companies.

The facts above given have an important bearing upon sales per capita, as given in Table 72. It has been seen that the two Newcastle companies combined far exceed every municipal plant; for, owing to the few very large power consumers which the Newcastle companies have, their sales are enormously increased, but for private lighting alone, they are less than any public plant.

The figures already given show the results of the various methods adopted to increase the use of electricity and the number of consumers. Liverpool relied principally upon its low price, upon its willingness to give estimates and to install a complete equipment for power service, and upon its complete stock of electrical supplies. It probably did less all told than any other undertaking, public or private, to develop its business; the same men are now in charge who managed the private company prior to purchase by the municipality, but the sales have grown from 1.78 units per capita per annum at date of purchase to 16.1 units now. The old company was not so eager to create new business as the municipality is at present. All other undertakings employed canvassers, issued circulars and made a more or less systematic attempt to develop business. Outside of the Newcastle Supply company, there seems to be little difference between the public and private undertakings, but this company excels all in its efforts and methods. Three of the municipalities carry appliances in stock, and two

maintain showrooms; Glasgow and Liverpool do not. Of the five private companies, two do and three do not. But when it comes to supplying electrical machinery and fittings, either for sale, hire or hire-purchase, the companies do considerably more, although Manchester and Liverpool are not far behind any of the companies except the Newcastle Supply company. St. Pancras does not have the power to sell or supply; Glasgow has been kept from doing so by the opposition of the anti-municipal traders, and the efforts of Manchester have been similarly repressed. (See H 20, 21).

In the matter of extensions, the municipalities have been as liberal as the companies, and during the year Glasgow and Manchester each laid a greater mileage than any company. Manchester has recently taken over powers to supply several suburban areas upon request and a great extension of business will doubtless take place in the near future.

Character of Plant.

A full description of the generating and distributing systems of all undertakings examined appears in Schedule III., H 2 and 3. Only a summary of the essential points is called for here, and naturally the most important factor is the adequacy of the plants to handle the business. Each undertaking is said to have sufficient equipment (H 30, 63 and 66) and to have maintained it in good condition, except certain minor defects at St. Pancras and the Newcastle District Company (H 65, 67 to 69).

Considerable difference was found between the relative efficiency of the plants and the extent to which they are up to date. Mindful of the many changes that have taken place in the electrical industry since its origin, and of its brief life, one would expect that the old works would be antiquated unless wholesale substitutions had been made, and that the new stations would be more modern. Hence, the undertakings which have developed most recently ought to have the best equipment. This explains to a large degree why the Newcastle Supply Company has two modern stations and one which is superior to all others. Up to 1903 the sales of this company were less than 5,600,000 units. In three years the output jumped to over 30,000,000, practically all of the increase being taken by a few very large power consumers. The other plants developed their business earlier, and, having built large plants at an earlier day, do not have such modern equipment.

The Manchester undertaking has three generating stations. One is modern in equipment and design; the other, although originally well planned, has become badly arranged from successive enlargements to meet the rapidly growing demand for current. Both were well located when built, but since the change, instituted by modern practice, from low transmission and distribution to high tension transmission and low tension distribution, their efficiency as generating stations has diminished and they will ultimately serve only as substations.

The location of the third station—the largest one—has been criticized. To obtain coal it was necessary to build an expensive viaduct, as the canal upon which it is located is too small for boats. It is also inadequate for condensing purposes, and cooling towers have been erected. The Manchester authorities justify the selection of the site because the land already belonged to the city, and, having been purchased for an extremely low figure, would make the capital costs far below any other site that could have been found. The building is perhaps somewhat more expensive than necessary, but in all other respects the station is thoroughly modern and efficient.

Liverpool has two large stations of modern design and ten small stations. Several of these are run in connection with refuse destructors, an arrangement which may be good for the street department, but hinders the proper development of the electric undertaking. The chief criticism of these small plants is that they have a large number of small units. These were largely inherited from the private company when purchased by the city, and the change to large dynamos has been postponed longer than was wise, although the conditions here are not so backward as they are in two of the London companies examined. One of the large stations is located in the heart of the city, and the other is about three miles from the centre. Both are well planned and splendidly constructed, although the arrangement of the boiler and engine rooms in one is not conducive to the greatest economy. The only objection to the station in the centre of the city is that there is not sufficient water in the canal to allow all of the units to be run condensing at the same time. The only criticism of the other station is that cooling towers are necessary and that its distance from the centre of the city necessitates a large investment in copper feeders to transmit the low tension current. However, the station will doubtless be used entirely for high tension distribution and this objection will then be removed.

In answer to certain criticisms that may be made against the location of this station, it is urged that it affords cheaper coal delivery than could be obtained anywhere by canal or river. The site gives ample cheap land, is convenient for distribution of low tension current to the tramways in this portion of the city, and also to a large [illegible] necessary. Mr. A. Bromley Holmes, the consulting engineer, states that if he were to reconsider the whole matter he would not alter his decision in view of the local conditions and [illegible] of the location, but would select the same location [illegible]

[illegible] large generating stations. The [illegible] is the largest, most efficient and [illegible] plant, conveniently arranged and well located [illegible] which furnishes ade[illegible] condensing water [illegible] by gravity, and [illegible] The other large station is well built [illegible] although not so well arranged [illegible] The third station is small and

not well designed, but as it was purchased from a private company the municipality is not responsible for its defects.

St. Pancras has two generating stations, both of old type, but in good operating condition. One generates only low tension current, the other both low and high tension. Both are run partly condensing only, and consequently their efficiency is below the highest standards. One station is not on a railroad or canal, and coal must be carted. One is partly hand-fired. The buildings are well built, but the arrangement is not in accordance with modern practice. There are two fine substations and three others for balancing purposes. The undertaking as a whole is not fully up to date, but alterations are under way and even now it is operated with economy and supplies good service.

The Newcastle Supply Company has three generating stations. One is not well situated for condensing purposes, and represents only a fair degree of efficiency. The principal station is probably the best designed of any investigated, although appearance has been sacrified to economy. The equipment is new and modern, and the efficiency is high. Of all the plants visited, it is the one most recently constructed, and, in fact, was not completed when visited. The third generating station is well designed, although artificial means for cooling are necessary because of the location.

The Newcastle District Company has three stations. In one, the buildings are old and dilapidated and the units small. Another is well designed, although cheaply constructed and inconveniently located for the supply of coal by railroad. The third station is of good construction and fair efficiency, calling neither for high praise nor harsh criticism.

The City of London Company has only one generating plant, located upon the Thames. The buildings are somewhat congested and poorly arranged. There are many small units and no large turbines, although the company has a large day load and considerable current is constantly in demand.

The Westminster Company has three stations. All are fired by hand and have small units. Coal is carted to two stations having no water or railway connections. The third is located upon the Thames. One is run non-condensing and a second has insufficient supply of water for this purpose.

The St. James Company has two stations, neither of which is located upon a canal or river or a railroad. Coal is carted, and the storage capacity is wholly inadequate. There is no water for condensing, but there is no body of water within the area of supply. The units are small in both plants, and all the boilers are hand-fired.

The Central Company does not distribute current, but sells its entire output to the Westminster and St. James companies, which entirely control it. Its one station was recently completed, is well arranged and up to the standard in all respects. Its location might be criticized, as cooling towers must be used for condensing purposes. It is outside of the areas of supply of both the Westminster and St. James companies, and it seems likely that a better location could have been secured.

Summarizing the above facts, it appears that one of the company stations is more modern and efficient than any one maintained by a municipality; but it is also true that two of the companies are more backward and have a more antiquated equipment than any municipality. Upon the whole, the municipal undertakings seem to be as modern as those belonging to the companies, but are not quite so well located or arranged. It is also clear that they represent a larger expenditure for ornamental and artistic purposes than the company plants, although one of the substations belonging to the Westminster Company was more elaborate and ornamental than any other station visited. The buildings generally impress one as being too massive and elaborate, but this is due in part to the more rigid building laws in force, especially in London.

Operating Efficiency.

Many subjects have already been discussed which indicate the relative efficiency of the various undertakings in certain regards, such as the character of service, extent of use, cost of production, prices charged, etc. Passing to the topics which have not been discussed, one naturally comes first to the question of capitalization.

TABLE 73. ANALYSIS OF APPRAISALS PER KILOWATT CAPACITY.

Undertakings.	*Land.*	*Buildings.*	*Boilers.*	*Generating Apparatus.*	*Total Appraisal.*
Manchester	£3.08	£13.10	£2.14	£6.99	£54.01
Liverpool	1.99[1]	4.65	2.59	4.10	36.44
Glasgow	4.35	17.37	2.47	9.02	109.72
St. Pancras.....	6.08	5.47	3.76	6.23	64.94
Municipalities	£3.03	£9.52	£2.48	£5.98	£54.30
Newcastle Supply..	£2.83	£6.60	£2.31	£6.22	£54.77
Newcastle District.	5.48	6.42	1.76	5.60	51.73
London City	7.36	8.87	7.76	5.42	72.14
Westminster	6.20	15.81	7.40	4.48	112.05
St. James	22.78	0.78	8.49	7.18	74.89
Central	15.07	11.52	6.20	5.69	47.18
Companies	£8.09	£9.21	£5.59	£5.70	£66.94

It is frequently asserted that municipalities are wasteful and extravagant, and that large sums are spent to provide expensive plant and equipment when a smaller expense would amply suffice. It is difficult to get conclusive evidence upon this point, but a comparison of the appraisals, made by the engineers, with the capacity of the plant will throw some light. Table 73 (computed from the data given under II 6 and 7) shows that upon certain points—buildings and generating apparatus—the municipalities have spent as a group slightly larger amounts than the companies, but that upon other items—land and boilers—the companies have exceeded by a considerable degree the expenditures of the municipalities. The total appraisal for all the municipalities is £54.30 and for the companies £66.94 per kilowatt capacity, indicating that the munici-

[1] This amount is an estimate and probably is too low.

palities have not been as wasteful or extravagant as the companies. If one should eliminate the Central company which supplies only in bulk, and the Newcastle Supply Company which also has unusual opportunities because of the large amount sold to a few customers and because of its agreement with the Priestman Power Company for cheap fuel supply, the difference would be still greater. Likewise a comparison of the St. Pancras municipal plant with the company plants in London will show a superiority for municipal management.

Comparing the municipal and company plants in London as regards the total expenditures chargeable to capital (Table 66), it is found that the former have a capital charge of £100 per kilowatt installed and the latter £99. When one recalls that in the case of several municipalities this capital charge includes large amounts paid in the shape of premiums to private companies whose plants have been purchased, it is clear that the capital expenditure upon plant and equipment alone would be less for the London municipalities than for the companies. Outside of London the municipalities have an average capital expenditure of £71.2 and the companies £88.6 per kilowatt capacity (see Table 67). The difference may be due in part to the fact that the municipal plants have a larger output upon the average than the companies, but it would not account for the whole difference, and it is quite clear that as a rule municipalities have not been either wasteful or extravagant. The low liabilities per unit sold (see Table 65) are further evidence upon this point.

If it were possible to eliminate the differences in local conditions, the fuel cost per unit would be a good test of operating efficiency, but no two plants, even in London, use the same kind of coal or pay the same amount per ton. Referring to Table 64, it will be seen that the lowest fuel cost per unit sold is that of the Newcastle Supply Company, but this company is more favored than any other undertaking in two regards. The cost of coal, considering the quality of the coal, is lower in Newcastle than in any other city visited. The company has also made an arrangement with the Priestman Power Company, which enables it to utilize gas from the coke ovens, which had formerly been allowed to go to waste, and the cost was so low that the company refused to make known to the Committee the amount paid. If allowance is made for these two factors, the difference between the Newcastle Supply Company, which had a fuel cost of .123d. per unit sold, and the cost in Glasgow, which was .215d., will become very small, if any difference is left whatever. But admitting that the operating efficiency of the Newcastle Supply Company is higher than that of any municipality, which is perhaps true, let us see what the Newcastle District Company has done even in view of the extremely low price of coal. The fuel cost of the Newcastle District Company is .351d. per unit sold—an amount greater than that of any municipality with the exception of the St. Pancras plant in London, which is most disadvantageously situated as far as a cheap

coal supply is concerned. It is clear, therefore, that the District company has a lower operating efficiency than the provincial municipalities.

Turning to the London undertakings, it appears that the City of London Company has a lower fuel cost per unit than any other company, and lower than the St. Pancras undertaking, but if allowance is made for the fact that the single plant of the City of London Company is located upon the Thames, which enables it to secure coal at a lower figure than that paid by St. Pancras, the difference will be considerably reduced.

The other London companies have fuel costs very much above St. Pancras. The Westminster Company has one plant upon the Thames, two others inland, and shares with the St. James Company the costs of the Central Company whose plant has just been completed and ought to be thoroughly modern, up-to-date and efficient in every regard. It is not located upon the river, but has other advantages which are said to counterbalance this fact. The area of the St. James Company is some distance from the Thames and coal cannot be obtained by water. These two companies, including the Central Company, are probably as advantageously situated as the St. Pancras plants, and the cost per ton of coal delivered should be approximately the same for the same kind of coal. The difference in fuel costs between these companies and St. Pancras indicates, therefore, that from the point of view of operating efficiency the municipal plant shows better results than the companies.

Regarding a considerable number of minor matters the engineers have reported in detail, and their replies show no marked difference between public and private plants (see H 28, 44-51, 75-92).

LOCAL INDEBTEDNESS.

The opponents of municipal activity have frequently tried to scare the British voter and to prejudice him against the operation of public utilities by local authorities by citing the large increase in local indebtedness within the last fifty years, as compared with the decrease of the national debt. They have pointed out that the local debt has more than trebled in the twenty-five years from 1875 to 1900, and that the amount of local debt per £100 of ratable value of property has doubled in the same period, while the national debt has decreased almost 18 per cent. (Schooling, *Local Rates and Taxes*, 1905). Upon these and other similar facts as texts, many pessimistic sermons have been preached, their thesis being that the piling up of debt is a monstrous danger and that therefore the municipalization of public utilities should stop.

It seems queer that any argument based upon one side of the balance sheet should be seriously urged by any one. Local indebtedness has increased; no one disputes it. But so also have the assets of the local authorities, and it would be as silly to declare that a company is insolvent merely from the fact that it has £1,000,000 in bonds outstanding, without knowing anything more, as it is to say that the municipalities are in a bad way merely because their debt

has increased. If an individual borrows £1,000 and spends it on fireworks he is placed in a quite different class from the man who borrows the same amount and invests it in a sawmill. From the viewpoint of indebtedness the two are precisely equal, but one has no physical assets representing the expenditure; the other has.

The same principles apply to local finance. Over 40 per cent. of the local debt is for water, gas and electricity works, tramways, markets, harbor improvements, wharves, cemeteries, baths, workingmen's dwellings, etc. In every one of these cases the debt is represented by physical assets. Besides, there are parks, street improvements, school houses, almshouses, bridges and many other investments which are now being used for public purposes and by which the present citizens are being benefited. What does the national debt represent? To a certain extent, public works of present use and value, but principally war expenditures or expenditures to guarantee success in case of war. This is not the place to discuss the wisdom of such expenditures; the expenditure of £1,000 on fireworks by an individual may be wise. But a war debt is in an entirely different class from that for school houses, water works, tramways, public baths, etc. In times of peace war debt ought to decrease and decrease rapidly; future generations will have their own problems to face without carrying our burdens and the burdens of preceding generations.

Further, debt for productive undertakings, such as gas works, electricity supply and tramways, has a quite different character from debt for schools, parks, prisons, etc. The latter do not produce a financial return, however necessary and valuable they may be. They may be even more important than electricity works, but the mere fact that they are not self-supporting places them in a distinct class. Their debt is a burden upon the taxpayer, for he must pay the interest thereon as well as the cost of maintenance. But in the case of the three public utilities here considered, it has been thoroughly demonstrated that the interest and fixed charges are paid by users or consumers and that in no instance has the taxpayer been called upon to make up any deficiency, except possibly temporarily, and then he has been repaid at a later time.

But this is not all. It has been definitely shown not only that the debt is not a burden upon the taxpayer, but that the taxpayer gets a financial benefit from municipal operation, and therefore from the very debt which is claimed to be a burden upon him. It is not evidence, but it is suggestive, that the local rates (tax rates) were lower for every group of towns when there was municipal operation of gas, electricity or trams than where companies were operating (see special report on Taxation in Great Britain). But positive evidence has been produced in the preceding pages, showing that under every subject very much more has been paid over to relieve taxation by the municipal undertakings than by the companies, although there are instances, particularly in the Scotch cities, where it is generally believed that profits from public utilities

should not be used to reduce taxation, and where nothing has been paid over, at least in certain years.

The reply is made that the paying over of such sums does not lower taxes, but that it results either in extravagance upon the part of city officials or in spending the profits on activities which would not otherwise be undertaken. The former assertion is not supported by experience, for the towns that have municipalized their utilities are noted for their efficient administration, and municipal operation seems to serve as an additional inducement to persuade able men to "stand" for a position on the council and to give their time freely when elected.

The latter assertion is not so easily proved or controverted. Those who make the assertion point to the general increase in taxes as evidence that municipal operation has not only not relieved taxation, but has actually increased it. But the fact of increasing taxation in and of itself proves neither that municipal operation is nor that it is not the cause of this increase, any more than the use of snuff is proved to be a cure for tuberculosis merely because a decrease in the amount used relatively has been coincident with an increase of tuberculosis.

The question resolves itself into this: If no payments were made to relieve taxation, would the tax levy be more or less than it is at present; and not, have taxes increased coincidently with such payments? Possibly no positive answer can be given, and quite likely the same answer would not apply to all cases. If a town were deprived of its annual transfer, "in aid of rates," probably the answer given would depend upon conditions. If it were thought that no outcry would result, it is likely that taxes would be increased instead of cutting off some work already undertaken. But if complaints would probably be numerous and energetically made, it is probable that retrenchment would be adopted, either until the natural growth of the city made it possible to continue as before or until by very small increments the total amount had been made up. In the case of Glasgow, probably a cessation of payments to the Common Good from the tramways would not affect the rates, but certain functions could not then be performed. However, Glasgow is not an instance of payments into the general city fund. The Common Good has no connection with taxes.

To return to the question, whether the debt incurred for gas works, electricity supply and tramways is likely to be a burden, for it has been seen that it is not now, certain persons insist that it is not only possible but probable that the taxpayer may be called upon to pay this indebtedness. They say that some new invention may entirely revolutionize the present methods of lighting, power and traction, and make the present plants worthless, and that then under municipal ownership the taxpayers will have to stand the loss, which would fall upon the stockholders of a private company had come. Such a condition of affairs is possible, no doubt, but no such sudden and revolutionary event has taken place in the three industries considered. It seemed that something approach-

ing it threatened gas when electricity first came into use, but it was met by the invention of the incandescent burner, and the funeral of the gas industry was postponed *sine die*. The life of cable traction was very short, but street railways are still being operated.

BRITISH TRAMWAYS.*

I.—THE MUNICIPAL MOVEMENT.

Municipal operation of street railways has made rapid progress in Great Britain in the last few years. From 1894 to 1906, the number of municipal systems rose from 3 to 123, a forty-fold growth in a dozen years.[1] The ratio of tramway undertakings operated by municipalities to the whole number of tramway systems in the Kingdom rose from 2 per cent. in January, 1894, to 49 per cent. in March, 1906, and is now over 50 per cent.; and the miles of line operated by municipalities increased from 2.6 per cent. in 1894 to 57 per cent. in 1906.

Prior to 1894 only Huddersfield, Blackpool and Plymouth had adopted municipal operation of tramways; the first two because no private company could be found to undertake the service, and the third because a company had tried and failed. In 1894 Leeds and Glasgow established municipal operation, because company management had been found very unprogressive and unsatisfactory. The marked success of these experiments gave the movement for municipalization irresistible momentum. Sheffield, Liverpool, London, Manchester, Birmingham, Belfast,[2] and many other cities and towns followed the lead of Glasgow and Leeds in the municipalization and electrification of their street railways; and the data for 1906 show that all the principal cities and towns of the Kingdom

*By Frank Parsons.

[1] Board of Trade Returns to House of Commons, 1894 and 1906.

[2] Belfast took full possession in 1905. In Birmingham the larger part of the lines were still under company operation in the spring of 1906. In London the County Council has nearly all the lines; in 1905 it operated 53 miles south of the Thames; April 1, 1906, it took over the 48 miles of the Northern system; it now owns and operates 115 miles out of the 128 in the county (Minutes of Council, April 23, 1907, p. 823). About 55¼ miles have been transformed by the Council for electric traction, and other lines are in process of electrification, all on the underground conduit plan, for the law does not permit the overhead system on these London lines. Horses are still used on a large part of the London tramways, the whole of the 48 miles just taken over from the North Metropolitan Company being horse railroad.

In New York City also there are still many miles of line operated with horses—45.62 route miles, according to the report of the State Railroad Commission for 1906.

The writer has before him a list of 73 leading cities and towns in the U. K. that have adopted municipal operation and electric traction. The aggregate population of these 73 cities and towns is 14,121,458, or nearly 70 per cent. of the total population in places of 20,000 or more inhabitants in the United Kingdom; and the other 50 municipalities operating tramways include a considerable part of the remaining urban population. The movement appears to be all one way; no city or town that has entered upon municipal operation has gone back to private operation.

Apparently the voltage was well maintained in all undertakings, the only case of unusual fluctuation being at St. Pancras, where there was a drop of nearly 30 volts upon two evenings, due to turbine troubles (H 23, 27).

Judging from the evidence before us, there was no difference between the municipal and the company undertakings as regards the promptness with which current was turned on (H 87) and complaints attended to (H 71, 73), the convenience of the location of offices (H 70), the testing of meters (H 17), the restoration of paving after streets were opened (H 46), the care given to street work generally (H 47-9), although there were more complaints upon this score against companies than municipalities (A 12), the construction of extensions (H 31), and the extent to which the entire area of supply was served (H 31-42) and appliances carried in stock for sale or rent (H 21). The companies, especially the Newcastle Supply company, did very much more in the way of renting motors to consumers than the municipalities; only one public plant—Manchester—has rented any. The municipalities excuse this situation by saying that it is very difficult and sometimes impossible to get authority to raise money by loans for this purpose, and that those who are opposed to municipal operation have fought the rental of apparatus to consumers and have prevented the extension of activity in a direction whereby consumption would be increased and the consumers greatly benefited. Thus, while it remains a fact that municipal undertakings do not reach out in this direction, their inactivity is due, partly at least, to artificial restrictions.

Although the municipal undertakings seem to have been as liberal and as progressive in the matter of extensions within the area of supply, they have not been permitted, except at Manchester, to go outside of their own boundaries. This has handicapped them somewhat at Glasgow and Liverpool, where there are large works which would doubtless take current in the suburbs along the Clyde and the Mersey. The Newcastle Supply company has powers in over a score of districts (A 17, 18, D 11), and sells over three-fourths of its output outside of Newcastle.

Extent of Use.

The available statistics regarding consumption in the several plants specially investigated are given in Table 72 (taken from H 16). The three London companies should not be compared with other undertakings. They supply areas which are given over principally to business and commerce. The population figures include only those who live there—the night population—and they are a very small proportion of those who have shops or offices or work there during the day. Current is used mostly for lighting offices, shops and theatres, and for power purposes in small factories. The Borough of St. Pancras is chiefly a residence district, occupied by artizans, clerks and small shopkeepers, who consume small amounts. There are some factories in the southern part, but prob-

ably the day population is less than the night. Under such circumstances, the fact that the population per service is as low as 85 and that the sales per capita are 28.3 units per year, indicates a very favorable condition of affairs.

Comparing the two Newcastle companies with the three municipal plants outside of London, it appears that Glasgow far surpasses them as regards the percentage of consumers to population, for 1 person in 60 has a service in Glasgow, whereas 1 in 87 does in Newcastle. But the Newcastle companies excel Manchester and Liverpool in about the same degree that Glasgow surpasses them. In view of the fact that there are two rival companies side by side in Newcastle, the superiority of Glasgow seems all the more remarkable, and the difference between Newcastle and Manchester and Liverpool is diminished. The Newcastle companies have avoided practically all of the evils of competition by dividing the area between them and have retained the advantages of competition by remaining in such close proximity that a constant comparison of methods, prices and character of service spurs each of them to give the better service at the lower rate.

The failure of Glasgow to supply current outside of its area has been made the basis of severe criticism. It would be much better if it did have the power to go outside, but it is not Glasgow's fault. It does not have the legal authority to do so, thanks to the very opponents of municipal ownership who condemn it for not supplying outside.

TABLE 72—CONSUMPTION OF CURRENT (UNITS).[1]

Undertakings.	*Population per Service.*	*Sales per Service.*	*Sales per Consumer.*	*Sales per capita.*
Manchester	106	2,576	2,576	24.3
Liverpool	116	1,857	1,857	16.1
Glasgow	60	1,443	1,443	24.0
St. Pancras	85	2,409	2,409	28.3
Newcastle—Supply	87	3,565	3,011	45.5
Newcastle—District		5,184	5,290	
London—City	7	2,587	1,601	381.5
Westminster	16	1,901	1,901	116.4
St. James	9	3,451	3,451	390.8

The difference between the Newcastle companies and the municipalities comes out all the more clearly when one compares the sales per consumer and per service. Glasgow, which has the largest number of users, has the smallest sales; then come the other municipal plants, with the Newcastle companies surpassing Manchester even. These facts lead one to suspect that the Newcastle companies make special efforts to get the large consumers, while the municipal undertakings pay more attention to the small

[1] Omitting all sales to street railways, steam railways and other companies to be resold outside of the area, but including all sales for commercial power.

consumers. This is clearly shown by comparing the number of power consumers with the total h. p. connected under H 8. It there appears that the average h. p. per power consumer in the three provincial municipalities being considered was 8, while in the Newcastle Supply company the average was 256. The average number of units used by the power consumers in Manchester, Liverpool and Glasgow was 3,652, 2,921 and 3,478 respectively; for the Supply company, 51,167. As already stated, over one-third of the entire output is sold to one company, one-fifth goes to a few customers in bulk and another one-third goes to 179 power consumers. Further, Newcastle sells three-fourths of its output outside of Newcastle, while Glasgow and Liverpool have no power to go outside of their boundaries. Each Newcastle company supplies only about one-half the current per capita for lighting that is supplied by the municipal plants, which convinces one that the small user is neglected by the Newcastle companies and that every energy is bent upon securing the big user, and the larger the better.

Whether this policy is a wise one, the reader must judge for himself. But it should be remembered that the large consumer, the owner of a big factory, is amply able to look out for himself ordinarily. Because of the large amount of current used he can easily establish his own power plant and generate current at a low cost. If the managers of an undertaking have any obligation to the community as a whole, it is first to look after the small user, the man who is dependent upon a common supply because of his inability to generate his own current at a reasonable rate. This the municipalities have done much more than the companies.

The facts above given have an important bearing upon sales per capita, as given in Table 72. It has been seen that the two Newcastle companies combined far exceed every municipal plant; for, owing to the few very large power consumers which the Newcastle companies have, their sales are enormously increased, but for private lighting alone, they are less than any public plant.

The figures already given show the results of the various methods adopted to increase the use of electricity and the number of consumers. Liverpool relied principally upon its low price, upon its willingness to give estimates and to install a complete equipment for power service, and upon its complete stock of electrical supplies. It probably did less all told than any other undertaking, public or private, to develop its business; the same men are now in charge who managed the private company prior to purchase by the municipality, but the sales have grown from 1.78 units per capita per annum at date of purchase to 16.1 units now. The old company was not so eager to create new business as the municipality is at present. All other undertakings employed canvassers, issued circulars and made a more or less systematic attempt to develop business. Outside of the Newcastle Supply company, there seems to be little difference between the public and private undertakings, but this company excels all in its efforts and methods. Three of the municipalities carry appliances in stock, and two

maintain showrooms; Glasgow and Liverpool do not. Of the five private companies, two do and three do not. But when it comes to supplying electrical machinery and fittings, either for sale, hire or hire-purchase, the companies do considerably more, although Manchester and Liverpool are not far behind any of the companies except the Newcastle Supply company. St. Pancras does not have the power to sell or supply; Glasgow has been kept from doing so by the opposition of the anti-municipal traders, and the efforts of Manchester have been similarly repressed. (See H 20, 21).

In the matter of extensions, the municipalities have been as liberal as the companies, and during the year Glasgow and Manchester each laid a greater mileage than any company. Manchester has recently taken over powers to supply several suburban areas upon request and a great extension of business will doubtless take place in the near future.

Character of Plant.

A full description of the generating and distributing systems of all undertakings examined appears in Schedule III., H 2 and 3. Only a summary of the essential points is called for here, and naturally the most important factor is the adequacy of the plants to handle the business. Each undertaking is said to have sufficient equipment (H 30, 63 and 66) and to have maintained it in good condition, except certain minor defects at St. Pancras and the Newcastle District Company (H 65, 67 to 69).

Considerable difference was found between the relative efficiency of the plants and the extent to which they are up to date. Mindful of the many changes that have taken place in the electrical industry since its origin, and of its brief life, one would expect that the old works would be antiquated unless wholesale substitutions had been made, and that the new stations would be more modern. Hence, the undertakings which have developed most recently ought to have the best equipment. This explains to a large degree why the Newcastle Supply Company has two modern stations and one which is superior to all others. Up to 1903 the sales of this company were less than 5,600,000 units. In three years the output jumped to over 30,000,000, practically all of the increase being taken by a few very large power consumers. The other plants developed their business earlier, and, having built large plants at an earlier day, do not have such modern equipment.

The Manchester undertaking has three generating stations. One is modern in equipment and design; the other, although originally well planned, has become badly arranged from successive enlargements to meet the rapidly growing demand for current. Both were well located when built, but since the change, instituted by modern practice, from low transmission and distribution to high tension transmission and low tension distribution, their efficiency as generating stations has diminished and they will ultimately serve only as substations.

The location of the third station—the largest one—has been criticized. To obtain coal it was necessary to build an expensive viaduct, as the canal upon which it is located is too small for boats. It is also inadequate for condensing purposes, and cooling towers have been erected. The Manchester authorities justify the selection of the site because the land already belonged to the city, and, having been purchased for an extremely low figure, would make the capital costs far below any other site that could have been found. The building is perhaps somewhat more expensive than necessary, but in all other respects the station is thoroughly modern and efficient.

Liverpool has two large stations of modern design and ten small stations. Several of these are run in connection with refuse destructors, an arrangement which may be good for the street department, but hinders the proper development of the electric undertaking. The chief criticism of these small plants is that they have a large number of small units. These were largely inherited from the private company when purchased by the city, and the change to large dynamos has been postponed longer than was wise, although the conditions here are not so backward as they are in two of the London companies examined. One of the large stations is located in the heart of the city, and the other is about three miles from the centre. Both are well planned and splendidly constructed, although the arrangement of the boiler and engine rooms in one is not conducive to the greatest economy. The only objection to the station in the centre of the city is that there is not sufficient water in the canal to allow all of the units to be run condensing at the same time. The only criticism of the other station is that cooling towers are necessary and that its distance from the centre of the city necessitates a large investment in copper feeders to transmit the low tension current. However, the station will doubtless be used entirely for high tension distribution and this objection will then be removed.

In answer to certain criticisms that may be made against the location of this station, it is urged that it affords cheaper coal delivery than could be obtained anywhere by canal or river. The site gives ample cheap land, is convenient for distribution of low tension current to the tramways in this portion of the city, and also to a large area supplied at high pressure. Mr. A. Bromley Holmes, the consulting engineer, states that if he were to reconsider the whole matter, he would not alter his decision, in view of the local conditions and the merits of the location, but would select the same location again, in spite of certain obvious objections.

Glasgow has one small and two large generating stations. The Port Dundas generating station is the largest, most efficient and one of the best designed, conveniently arranged and wisely located stations visited. It is situated near a canal which furnishes adequate condensing water, that flows to the condensers by gravity, and from which coal is obtained. The other large station is well built and represents good modern practice, although not so well arranged or so efficient as the other station. The third station is small and

not well designed, but as it was purchased from a private company the municipality is not responsible for its defects.

St. Pancras has two generating stations, both of old type, but in good operating condition. One generates only low tension current, the other both low and high tension. Both are run partly condensing only, and consequently their efficiency is below the highest standards. One station is not on a railroad or canal, and coal must be carted. One is partly hand-fired. The buildings are well built, but the arrangement is not in accordance with modern practice. There are two fine substations and three others for balancing purposes. The undertaking as a whole is not fully up to date, but alterations are under way and even now it is operated with economy and supplies good service.

The Newcastle Supply Company has three generating stations. One is not well situated for condensing purposes, and represents only a fair degree of efficiency. The principal station is probably the best designed of any investigated, although appearance has been sacrified to economy. The equipment is new and modern, and the efficiency is high. Of all the plants visited, it is the one most recently constructed, and, in fact, was not completed when visited. The third generating station is well designed, although artificial means for cooling are necessary because of the location.

The Newcastle District Company has three stations. In one, the buildings are old and dilapidated and the units small. Another is well designed, although cheaply constructed and inconveniently located for the supply of coal by railroad. The third station is of good construction and fair efficiency, calling neither for high praise nor harsh criticism.

The City of London Company has only one generating plant, located upon the Thames. The buildings are somewhat congested and poorly arranged. There are many small units and no large turbines, although the company has a large day load and considerable current is constantly in demand.

The Westminster Company has three stations. All are fired by hand and have small units. Coal is carted to two stations having no water or railway connections. The third is located upon the Thames. One is run non-condensing and a second has insufficient supply of water for this purpose.

The St. James Company has two stations, neither of which is located upon a canal or river or a railroad. Coal is carted, and the storage capacity is wholly inadequate. There is no water for condensing, but there is no body of water within the area of supply. The units are small in both plants, and all the boilers are hand-fired.

The Central Company does not distribute current, but sells its entire output to the Westminster and St. James companies, which entirely control it. Its one station was recently completed, is well arranged and up to the standard in all respects. Its location might be criticized, as cooling towers must be used for condensing purposes. It is outside of the areas of supply of both the Westminster and St. James companies, and it seems likely that a better location could have been secured.

tion of this factor was itself the result of municipalization and the impulse given by it to outstanding private managements.*

The success of Glasgow, Liverpool and Leeds, with electric traction, extension of lines and reduced fares, brought about a revolution in the tramway service of Great Britain, leading many cities and towns to municipalize and electrify their lines, and compelling the remaining companies to improve their systems also, and reduce their fares.

The change in the hours of labor resulting from municipal ownership and operation is shown in Table 3.

TABLE 3.—HOURS PER WEEK FOR CONDUCTORS, DRIVERS AND MOTORMEN, POINTSMEN AND INSPECTORS.

	Under company management.	*Under municipal managemen.*
London[1]	77 to 91	60
Liverpool	91 to 105	60
Manchester	70	54
Glasgow	77 to 98	54
Leeds	81	60
Sheffield	102	60
Birmingham	90 to 100	60
Birkenhead	91	65
Bolton	78	60
Bradford	70 to 80	60
Hull	80	60
Sunderland	84	60
Wallasey	95	63

Wages rose while hours decreased. Sheffield nearly doubled the hourly wages of drivers and conductors. Manchester lifted the hourly wage 43% for motormen and 63% for conductors, and the concessions to labor amount to $200,000 a year. Liverpool increased wages 50%, one-third of the total wage payment being a voluntary addition by the city to the rates paid by the company. Glasgow raised wages 16 to 25 per cent. at first, with periodic subsequent advances which have lifted wages 68 to 100 per cent. above the wages the company paid, and the total concessions to labor

* According to Board of Trade statements made in answer to direct questions at the interviews granted by the Board to this Commission, the first electric tram line in Great Britain was put in by the municipal tramway management at Blackpool, and the first systems to decide upon full transformation to mechanical traction on a large scale, were also municipal systems. When Glasgow and Leeds began to move in the matter of electric traction, British tramways were still in the horse age. City after city was obliged to municipalize its street railways in order to secure the improvements demanded by the progress of invention and the development of the community. (For details, see Special Report on British Tramways, Vol. III., subhead, Glasgow, note 6.).

[1] One of the London companies established a 70-hour week for conductors and drivers, with 81 hours for inspectors, and 84 hours for foremen and depot foremen. But most of the companies worked conductors and drivers 77 to 80 hours, and inspectors went as high as 91 hours.

amount to more than $500,000 a year.[7] The labor benefits of municipal operation did not stop with the municipal employees, for this policy of the municipal managements created a sentiment that forced the remaining companies to give better wages and shorter hours.

In respect to labor, the public managements aim at the same things trade unions aim at: (1) A standard living wage that a white man can live on and raise a family respectably; (2) Permanent employment; (3) Good general conditions, as to health, safety, etc.; (4) Settlement of differences by conference and arbitration.

The Board of Trade returns for 1906 reveal the contrasts noted in Table 4 and the comments accompanying it.*

TABLE 4.—TRAMWAY RETURNS FOR THE UNITED KINGDOM.

			Percentages.	
	Local authorities.	*Companies.*	*Local Authorities.*	*Companies.*
Undertakings owned	175	137	56	44
Miles of track.....	2,499	1,009	71	29
Capital cost per mile of track.	£14,870	£19,250	..	..
Undertakings worked	123	127	49	51
Route mileage.....	1,276	963	57	43
Net revenue	£2,529,752	£1,277,663	..	..
Per cent of return on capital.	.....	.....	8	4.8
Net revenue per mile.....	£1,980	£1,365	..	..
Net revenue per car—mile.....	7.82 cts.	6.86 cts.	..	..
Average fare per passenger....	2.1 cts.	2.43 cts.	..	..
Operating cost per passenger..	1.3 cts.	1.72 cts.	..	..

It appears that the average fare is considerably higher for the companies than for the public systems, and yet the companies have a higher percentage of operating cost to income—66 per cent. for the companies against 63 per cent. for the municipalities. The average working cost per passenger is less than 1⅓ cents for the public systems, and nearly 1¾ cents for the companies, or 32 per cent. higher operating cost for the companies than for the municipalities. Their capital per mile is larger,[8] and their net revenue considerably less than for the public systems—the return

* For further details, see Special Report on British Tramways in Vol. III.

[7] Dr. F. C. Howe, writing for the United States Department of Commerce and Labor (U. S. Bulletin of Labor, January, 1906, p. 67), estimates that the reduction in hours of tramway employees during the period of rapid municipalization and electrification, amounted to 48 per cent., and the increase of wages at the same time he puts at 42 per cent. We have not sufficient data before us to make so broad a generalization, but it is certain that in some cases the company schedule of hours was nearly 100 per cent. above the working week established under municipal management, and that the wages per hour have been lifted 40 to 100 per cent., and even more in some of the best systems, for men who have been long enough in the service to prove their value. For the policy of municipal and company systems in respect to workmen's fares and service, see Special Report on British Tramways, Vol. III.

[8] For comments on this see Special Report on British Tramways in Vol. III.

on capital being 4.8 per cent. for the companies against 8 per cent. for the municipalities. With 57 per cent. of the mileage, the municipal systems ran nearly twice as many car miles as the companies, and carried more than twice as many passengers. Their profits are £1,980 per mile against £1,365 for the companies, and 7.82 cents per car mile against 6.86 cents for the companies. The municipalities realize a very large profit on an average 2-cent fare for the whole group of local authorities operating their tramways,[9] while the companies have a much higher cost and obtain a smaller profit in spite of an average fare of nearly 2½ cents.

The municipalities *own* 1,491 miles of line against 748 miles owned by companies. But the municipalities still lease 215 miles, so that the companies *operate* 963 route miles against 1,276 route miles for the municipalities. Most of the lines are double track. Measuring the whole mileage as single track, the municipalities own 2,499 miles of track and operate 2,139 miles, while the companies own 1,092 miles of track and operate 1,452 miles.

The municipal systems ran 154,965,781 car-miles against 89,183,683 for the companies; 72,450 car-miles per mile of *track operated* by municipalities against 61,430 car-miles per mile of track operated by companies. In other words, the service given by the municipalities is nearly 20 per cent. more frequent than that afforded by the companies.

In many cases the increased frequency of service under municipal ownership was most remarkable. In Liverpool, for example, the closest service the company gave was a headway of 7 minutes, with longer intervals on most of the lines. The city has cut the minimum headway down from 7 minutes to ¼ of a minute, and the maximum headway from an hour to a quarter of an hour. Glasgow, Manchester, Leeds and Sheffield have also cut the average headway to a small fraction of what it was under company management.

There has been an increase of political and social efficiency as well as of economic efficiency. Under the company regime, democracy was at a discount; popular sovereignty was below par. The people found they could not control their own streets, nor secure fair treatment of labor in public service industries, nor obtain rapid transit and other vital improvements on reasonable terms. The tramway owners, with the power of private monopoly in their hands, overruled the will of the people.

The companies behave much better now. Not only has the fear of speedy municipalization in case they do not satisfy the new standards and the educated public sentiment developed by municipal operation made a strong impression on the remaining companies, but they have also been stimulated by municipal example to do their best to rival the advancement made by public managements. They give more consideration to public opinion, and pay more regard to the public interest in the conduct of their business.

[9] For details and comments see Special Report on British Tramways in Vol. III.

But the dominance of public interest, so far as it has been secured either in public or private systems, is in a large measure the result of the development of municipal operation. For some purposes the power to municipalize is almost as effective as municipalization itself. Under the pressure of new standards and an educated public sentiment, developed by municipal operation, in the full publicity created by it in respect to all tramway costs and methods, the present companies at their best[10] are managed with so much regard to the common interest, that a casual observation might lead one to think there is nothing to be gained by further municipalization. Yet the cities and towns continue to municipalize the tramways. They believe that a well managed public tramway is better from the public standpoint than even the best private system, for several reasons: (1) It secures to the public the profits taken from the public through their patronage of public service monopolies operating under franchises granted by the public; (2) It tends to lower fares and wider distribution of the benefits of the service—a public plant is more apt to regard a surplus as a reason for reduction of charges; (3) It aims primarily at service, while the company management must aim at dividends—it is benefit for all versus profit for a few as the fundamental motive and purpose; (4) It gives the municipality direct and complete control of its streets in place of indirect and partial control; (5) It eliminates the opposition of interest between the owners and the public, which may at any time give rise to difficulty, dispute and obstruction of the public will and interest; (6) It makes the managers the direct agents and employees of the people instead of the agents of a company employed and paid by private parties to work for the interest and obey the instructions of those parties—a city as well as an individual can control its own servants and make them obey its will and wish better than the servants of some other person; (7) It adds a new field for civic activity and the development of civic interests and motives and the habits of thought and action on which good citizenship depends.

Municipal operation of tramways in Great Britain has been developed for the most part under fairly good political conditions. City councils as a rule do not manage public affairs on party lines but on business principles. Competent engineers and managers of public works are appointed and kept in place during good behavior. All employees are selected and promoted with regard to fitness and without regard to party affiliations. The spoils system is practically eliminated. Moreover, many substantial business men manifest a high degree of civic spirit, entering councils and serving on tramway and other committees without pay and with a zeal fully

[10] Such examples do not of course represent private ownership per se, but private ownership chastened and modified by the prevalence of public ownership, not merely regulated by law. The old companies were regulated, but regulation did not prove effective. The present companies are controlled not so much by the law as by an enlightened public opinion developed by the power and practice of municipal operation and the publicity that goes with it.

equal to what they give their private business. The marked success of municipal operation in Great Britain has been largely due to these political and civic conditions. But these conditions in their turn have been largely due to the development of municipal operation of public utilities.[11] There has been a mutual interaction.[12]

II.—SYSTEMS SPECIALLY INVESTIGATED.

Four public tramway systems (Glasgow, Manchester, Liverpool, and London County Council) and four private systems (London United, Bristol, Norwich, and Dublin) were chosen by the Commission for special study and comparison, but one of the private systems, the Bristol Tramways Company,* refused to be investigated, so that our schedules cover only seven plants. The Board of Trade returns, however, and the company's reports, supply the Bristol data needed for most of the comparative tables. All the systems are overhead trolley except the London County Council lines, which use the underground electric conduit, the trolley not being allowed in London. All but 4 miles of the London United system is in Middlesex and Surrey, so it can use the trolley.

I.—Financial Conditions.

What is the financial condition of the tramway systems we are examining? If they were closed out or subjected to compulsory sale on the principle of the Tramways' Act, would their assets cover their liabilities? The data of tables 5 and 6 derived from Schedules III. and IV. answer the question.

The structural value of each plant, or cost of duplication less depreciation, was estimated by the Commission's engineers, one representing company interests, and the other municipal interests. The valuations were made as they would be made by engineers working with arbitrators or as arbitrators, and are very close to the

[11] See Report of Prof. Commons on Labor and Politics, and testimony of the Rt. Hon. John Burns, Robert Donald, etc., in the General Introduction to this report, and in the minutes of the London hearing at the close of the volume.

[12] The space limits fixed for this report exclude a large amount of valuable data and illustrative material which we collected relating to the history of British tramways. Part of this matter will be found in the Special Report on British Tramways in Vol. III.

* The writer visited Bristol, went over the system, met the company's manager, and some of the leaders in the Council and in the business life of the city, and made a study of the company's reports and public documents, and interviews with the company's manager and some leading members of the city government, made it clear that both the face capitalization and the market capitalization of the system are greatly in excess of tangible assets. The face value of stocks and bonds is $6,500,000, and the market values amount to $7,500,000 (using round figures at $5 to the £), against real assets of less than $3,500,000, or an excess of market capitalization amounting to something like 114 per cent. of real values. In nine years the city will have a right to buy the plant at structural value, which is estimated now at $2,500,000. This makes the relation between physical assets and capitalization specially unsatisfactory, and enables us to understand why the company did not wish to be investigated.

fact. In Dublin, after the valuation was made, the engineers went to Mr. Tresilian, the secretary of the tramway company, and said: "Do you know that you have a great deal more capital than you have values?" Tresilian looked at the appraisal showing a value of £1,027,749, took a book from his desk, went over the engineers' figures, and said: "You are quite right, only you have put it a little too high; it is about £10,000 too much." As the valuation was over a million pounds, the margin of error according to the company's own data, was less than 1 per cent.

TABLE 5.—ASSETS AND LIABILITIES.

	Assets.		*Liabilities.*	
	(A) [1] *Structural Value of Plant.*	(B) [2] *Quick Assets.*	(C) *Loan Debt Outstanding.*	(D) [3] *Floating Liabilities.*
Glasgow	£2,314,199	£311,786	£1,783,083	£32,582
Manchester	1,192,866	355,542	1,504,649	208,083
Liverpool	1,103,906	525,905	1,666,402	[4]79,995
Municipalities.				
			Stocks and Bonds.	
London United.....	£1,068,680	£132,678	£3,341,042	£77,533
Dublin United.....	1,027,749	99,688	2,012,000	44,570
Norwich	160,389	10,037	330,000	6,896

Companies.

The London County Council system being in process of transformation to electric traction, no satisfactory estimate of value could be made. As our engineers were not allowed to appraise the Bristol company's system, the schedules contain no valuation for that plant either. So these two systems are omitted from the table.

Glasgow has about $4,000,000 more assets than liabilities (Table 6). Manchester did not begin to municipalize until 1901, and only took full possession in 1903, so that the city has not had

[1] These valuations and the other figures of the schedules relate to the year ending Dec. 31, 1905, for the companies and March 31 or May 31, 1905, for the municipalities (except Liverpool, whose year ends Dec. 31). This gives the companies 9 months advantage—9 months more for development. The Board of Trade groups the returns the other way. For example, the returns of the board to the House of Commons, dated April 5, 1906, cover the year ending Dec. 31, 1905, for the companies, and the year ending March 31, 1906, for the cities. This gives the cities 3 months the advantage, but is 6 months nearer an even date than by the other method. Our experts began working in Great Britain in the winter of 1906. They could get the company figures to the end of 1905, but the latest municipal figures then available were for 1904-5, ending in March or May, 1905, so they adopted the plan above stated.

[2] The quick assets of column B cover the value of materials on hand, cash, debts due to the plant, reserves and sinking funds, etc., invested and available for payment of liabilities.

[3] The floating liabilities of column D consist of debts owing by the system to various creditors, bank overdrafts, etc.

[4] From the tables of Schedule IV. the floating liabilities of the Liverpool tramways would appear to be £105,315, but the detailed explanation accompanying the tables shows that the £25,320 contributed to relief of rates was by mistake added in to the amount set down as owing to sundry creditors, making the "sundry creditors" item in the table £25,320 too large.

time to write off the whole cost of the old horse system;[1] and the department is also carrying £100,000 of capital outlay for street improvements in the centre of the city round the Infirmary. Liverpool bought the lines in 1897, and has paid off about $1,000,000 (Table 8) of the tramway debt, but has not yet overcome the handicap with which she began in consequence of buying out the company eighteen years before the end of its term so that franchise values had to be paid for.

TABLE 6.—SURPLUS OR DEFICIENCY.

	(E) Total Tangible Assets (Sum of A & B from Table 5).	(F) Total Liabilities (Sum of C & D from Table 5).	(G) Excess of Assets Over Liabilities.	(H) Excess of Liabilities Over Assets.	(I) Per Cent. of Liabilities Uncovered.
Glasgow	£2,625,985	£1,815,665	£810,320	.....	0
Manchester	1,548,408	1,712,732	.....	£164,324	9
Liverpool	1,629,811	1,746,397	.....	116,586	7
City group.....	£5,804,204	£5,274,794	£529,410	net	0
London United.....	£1,201,358	£3,418,575	.....	£2,217,217	65
Dublin United.....	1,127,437	2,056,570	.....	929,133	45
Norwich	170,426	336,896	.....	166,470	50
Company group..	£2,499,221	£5,812,041	.....	£3,312,820	57

The London United has $16,580,000 of capitalization and $5,820,000 of tangible assets, an excess of liabilities amounting to nearly 200 per cent. of physical values. In other words, the capitalization is nearly three times the structural value of the plant plus the quick assets.[2] As a matter of fact the bonds more than cover the real assets, leaving the entire £2,010,042 of stock without any basis in physical values. The Dublin United has $4,500,000 more capital than tangible assets, an excess of 45 per cent. of the capital and 83 per cent. of real values. If the companies under short term franchises allow their capitalization to go so far above their solid assets, what would they do if they had unlimited franchises as the municipal systems have?

Nearly three-fourths of the $1,200,000 stock of the Dublin United is also without physical basis, so that a 6 per cent. dividend on stock means about 23 per cent. (22.8 per cent.) dividends on the physical values represented by the stock. A strong contrast is presented by Dublin's $4,500,000 excess of liabilities and Glasgow's $4,000,000 excess of assets.

[1] The city owned the track but paid the company £263,158 (about $1,280,000) for cars, depots, etc., as fixed by arbitration under the act of 1870. Both track and cars had to be scrapped.

[2] During the visit of the Commission with Sir Clifton Robinson, the managing director and principal stockholder in the London United, he said: "We can build and equip a mile of double track (overhead trolley) for £20,000, and do it well." Yet the capitalization of the company is over £90,000 per mile of double track. The company's books show £18,000 per double mile spent for street widenings and improvements. But this still leaves £52,000 or $250,000 per mile unaccounted for.

The three municipalities together have $2,560,000 more physical assets than liabilities, while the companies have $15,850,000 more liabilities than assets, and their limited franchises also are much less valuable than the unlimited franchises of the municipal systems. In the municipal group the tangible assets more than cover liabilities; in the company group 57 per cent. of the liabilities are left uncovered by physical assets. As compared with the liabilities of the public tramways, the companies' liabilities are more than twice as great per mile of track and per £100 of assets, and over four times as much per 1,000 passengers (Table 7).

TABLE 7.—LIABILITY RATIOS.

	Liabilities per £100 of Assets. £	*Liabilities per Mile of Single Track Owned. In Thousands of £*	*Liabilities per 1,000 Passengers.* £
Glasgow	69.1	13.3	9
Manchester	110.6	16.1	13
Liverpool	107.1	17.6	14
Municipalities	90.9	15.0	12
London United	284.5	47.8	69
Dublin United	182.4	21.2	41
Norwich	195.9	17.4	45
Companies	232.6	31.0	54
Company liabilities greater by.	156%	106%	350%

The public plants have paid off or covered by sinking funds, $5,650,000 of bonded debt (Table 8). The companies have neither paid off anything nor provided any sinking fund. The law requires municipalities to pay off their tramway debts within thirty years, the period on each loan being subject to the approval of the Board of Trade. Municipal policy, however, and not the law, is clearly the moving force in Glasgow and Liverpool at least, for they are providing for the extinction of their tramway debts much more rapidly than the law demands. Companies are not required to pay off their capital debt.

The public plants have set aside $6,300,000 out of earnings to build up depreciation and renewal funds (Table 9). In addition to this, the cities have some reserves and surplus, and have written off large amounts for depreciation out of revenue. In Glasgow the whole cost of the horse system, over $900,000, has been written off out of revenue (Schedule IV). The horse debt is also being written off in Manchester, Liverpool and London. Glasgow has spent $1,392,000 on actual renewals out of her depreciation fund and has $3,770,000 still left in the fund. In addition to this depreciation fund the department has accumulated a reserve fund of $148,000, which has been provided out of surplus profits. Liverpool, at the end of 1905, had a balance of $1,314,000, represented by a loan of $485,000 to the water department, working capital and cash in bank, and in addition to this, all renewals

(except two items of electric welding and alteration of lines) have been charged to current revenue instead of drawing on the depreciation and renewal fund. The London County Council, even in the brief period it has been operating, has accumulated a balance of $340,000 to the credit of depreciation, renewals and reserves, and has also written off out of revenue, $122,000, representing the cost of temporary stations required while converting horse lines to electric traction.

TABLE 8.—LOAN CAPITAL OR BONDED DEBT PAID OFF.

(Schedule IV; figures for 1905.)

	Date City Took Possession.	*Total Funds Borrowed on Bonds.*	*Amount Paid off or Provided for.*	*Net Debt.*
		£	£	£
Glasgow	1894	2,232,358	449,275	1,783,083
Manchester	1901 to 1903	1,550,874	67,321	1,483,553
Liverpool	1897	1,869,130	[1]436,544	1,432,586
London C. C.	1899 to 1906	2,415,329	[2]208,364	2,206,965
Total			1,161,504	
	Date Company Began.			
London United	1901	1,331,000	.....	1,331,000
Dublin United	1872	812,000	.....	812,000
Norwich	1901	66,000	.....	66,000
Bristol	1875	250,000	.....	250,000

In other words, the city plants are making full provision for both kinds of depreciation—ordinary wear and tear, and obsolete plant.

TABLE 9.—DEPRECIATION, RENEWALS AND RESERVES.

	Depreciation and Renewals Fund, 1905.	*Reserves and Surplus.*	*Totals.*
	£	£	$
Glasgow	777,637	32,590	810,227
Manchester	185,086	63,674	248,760
Liverpool	271,019	44,189	315,208
London C. C.	[3]64,051	7,054	71,105
Total	1,297,793	147,507	1,445,300
London United	.....	16,116	16,116
Dublin United	2,500	28,107	30,607
Norwich	.....	4,795	4,795
Total	2,500	49,018	51,518

[1] The amount *paid off* by Liverpool is stated in Schedule IV. as £202,728, but the schedule also states that Liverpool has an unapplied sinking fund of £233,816, which brings her net debt down to £1,432,586. The Liverpool tramway report for 1905 shows £288,170 in sinking funds, but the tables follow the schedule which transfers about £56,000 from the sinking fund account to the renewal fund account.

[2] The table shows the schedule figures, which cover only the southern system. The complete data for both systems as shown in the report for 1906 are £4,724,477 capital expenditure, £450,018 repaid out of revenue, and £4,274,461 outstanding debt.

[3] From the Council's reports. The schedule has a similar amount credited to reserves, but in the Council's accounts it is renewal fund.

The companies do practically nothing in the way of accumulating depreciation and renewal funds.[3] They have some small reserves and claim to cover renewals out of revenue as they come along, but the researches of our engineers and accountants show that this is a mistake. Only a small part of renewals is covered in this way. The engineers found a greater depreciation in the company systems than in the municipal plants.[4] (See Schedule III.) The companies do not write off depreciation from their capital accounts, nor provide in any way for the sort of depreciation that results from invention and the adoption of new methods—a kind of depreciation that may render obsolete, and necessitate the scrapping of, a whole system, as in the case of the horse trams when electric traction came in.[5]

In view of the current statement that municipalities do not make sufficient allowance for depreciation, this record is of special interest, since it appears from our schedules that the municipal systems are writing off capital as it dies, and making more than ample provision for all sorts of depreciation, while the companies do not write off dead capital, nor make any provision for depreciation from the progress of invention.

In addition to the payment of regular taxes, just as if they were private concerns,[6] the four municipal street railway systems under consideration have paid over $4,000,000 in relief of taxation (Table 10). The companies have paid nothing. They are not working for the public, and are content to confine their payments to the regular tax rate, which are reduced for them, as for other property owners, by the payments of the public trams when they are in the same district. In Manchester, where the city tramways pay about $250,000 a year to reduce the general rate of taxation,[7] the theory is that payments in relief of rates aid the

[3] According to the schedules neither the London United or the Norwich company have any such funds. The Dublin United in 34 years has put by £2,500 for depreciation and renewals on a system valued at £1,027,749. Bristol, in over 30 years, has paid £18,248 into renewal funds. The company has also reserves amounting to £128,522, which is considerably more than the other companies have accumulated, and yet is far from sufficient as we have seen in Part II.

[4] As a matter of fact some renewals are paid for out of revenue by both public and private plants, being blended with repairs. But large renewals as a rule are paid for out of the renewal funds of public plants and out of new capital by private plants, new issues of stocks or bonds being made if necessary.

[5] Those who think the law of England has lost all tendency to favor the public service companies should note their immunity from any requirements in regard to depreciation or provision for repayment of capital.

[6] It is the policy of Parliament to put such revenue-producing public undertakings as tramways and lighting plants on the same basis as private companies in respect to taxation, so that the cost of operation includes both local and national taxes at the regular rates.

[7] The public trams of Leeds also pay about $250,000 (£51,500) a year in reduction of the tax rate. Smaller systems also pay good sums in many cases; for example, Nottingham, £15,000; West Ham, £8,000; Hull, £10,000; Sheffield, £9,000; Blackpool, £4,500; Bolton, £4,058; Salford, £13,000, etc.

whole city, including the laboring classes, by attracting capital. Low taxes, it is said, encourage capital to come and develop the city and employ labor, more than slightly lower prices for transit or lighting. The community expects about £50,000 from the tramways in reduction of rates. The rest of the surplus is used for reduction of fares, special improvements, etc. There are periodic debates in the council on the question, and some strongly advocate the reduction of fares to cost, but as yet the payments in aid of rates continue. In Glasgow the policy is to reduce charges and pay off capital rather than pay large sums in aid of taxation. "If you pay to reduce taxes," the management says, "you make the poor man or girl who uses the trams pay part of the taxes of the rich man who uses an automobile."

TABLE 10.—PAYMENTS IN AID OF TAXATION.

	"Payments in Relief of Rates."		Total.	Number of Years.	Average per Year.
	1905. £	1906. £	1906 Payments. £		£
Glasgow[1]	25,000	35,000	191,760	12	15,980
Manchester[2]	51,000	50,090	197,000	5	39,400
Liverpool[3]	25,000	25,320	152,603	6	25,434
London C. C.[4]	.....	.....	293,592	6	48,932
Total	.....	.....	834,955	..	28,791
London United	.....	.....	.....	6	.....
Dublin United	.....	.....	.....	34	.....
Norwich	.....	.....	.....	6	.....
Bristol	.....	.....	.....	32	.....

It is persistently affirmed by opponents of municipalization in this country, that public ownership in Great Britain has raised the local tax rates, and that rates are much higher in the public ownership cities than in those which retain private operation of public utilities. The reverse of this is the case. The average local tax rate in the municipal ownership cities, taken as a group, is little more than half the tax rate in the private tramway districts (Table 11). Glasgow has gone more deeply into public ownership than any other city, and she has the lowest tax rate in the list, 3s. 2d. in the pound, about one-third of the rate in Dublin, Norwich and

[1] Glasgow's payments are not directly in aid of rates but are made to the "common good" fund which is used for various public purposes. The payments are therefore indirectly in aid of rates.

[2] The first year that Manchester had possession of the whole tramway system was 1903-4. Since full possession was secured, i. e., for the three years 1904 to 1906 inclusive, the city trams have paid an average of more than $50,000 a year in aid of rates.

[3] The act of 1897 prohibited the application of profits to relief of rates till 1912, but in 1902 Parliament authorized such payments on the part of the Liverpool tramways, and under this authority payments were made for 1901 and each succeeding year.

[4] Schedule IV., as is there stated, gives the payments in relief of rates for only a part of the County Council's tramways. The amounts here given are taken from the tramway reports of the County Council. The heavy expense of reconstructing the lines for electric traction has temporarily prevented payments in aid of rates, so that the last three years show no entry under this head.

Bristol. Most of the London United Tramway system is outside of London, so that it gets a lower average local rate than the London County Council, whose lines are in the city.

TABLE 11.—LOCAL TAX RATES.

Average Local Taxes Paid by Tramways and Other Properties in the Same Districts.

	Rateable Value.	*Local Tax Rate.*	*Amount of Taxes Paid by the Tramways.*
	£	*s. d.*	£
Glasgow	245,464	3/ 2	38,782
Manchester	71,632	7/ 3	25,912
Liverpool	48,011	7/ 9	17,427
London C. C.....	54,370	7/ 7	20,525
Municipalities	419,477	4/10	102,646
London United	20,000	7/ 4	7,505
Dublin United	28,500	8/ 9	12,401
Norwich	2,130	9/10	1,047
Bristol	.....	9/ 5	.....
Companies	50,630	8/ 3	20,953

This table is taken from the special report on taxation by Dr. Maltbie, except Bristol, for which the rate is given in the Municipal Year Book.

Similar contrasts are found to exist in comparing the public and private ownership cities in which the gas and electric plants selected for special investigation are located; in all these groups of cities Dr. Maltbie finds the local rates are lower in the public ownership municipalities than in the private ownership districts. Many similar contrasts appear in the general tax lists, for example Belfast, where the city owns and operates the tramways, gas and electric systems and the water works, has a local rate of 5s. 2d. against 8s. 9d. in Dublin, where neither the tramways nor gas works are public property.

Interest Charges.

The municipalities can get money at ½ per cent. to 1 per cent. lower interest than the companies, as shown in Table 12. The savings to the municipalities in 1906 by reason of lower interest charges amount to more than $320,000. The approximate estimates of column 6 indicate total interest savings of nearly $2,000,000 for the whole municipal period.

TABLE 12.—INTEREST.

	Rate Paid by Companies.	*Rate Paid by Cities.*	*City Lower than Company.*	*Savings to Cities. 1906.*	*No. of Yrs.*	*Total Savings from Lower Interest.*
Glasgow	4 %	*3 %	1 %	17,320	12	137,100
Manchester	4 %	†3½ %	‡½ %	6,800	6	33,650
Liverpool	4 %	*3¼ %	*¾ %	10,330	9	80,760
London C. C.....	4-4½ %	3¼-3½ %	¾-1 %	[1]32,050	8	[2]147,000
London United....	4-4½ %	3¼-3½ %	¾-1 %	.....	..	.....
Dublin United.....	*3½ %	*3½ %	.....	.....	..	.....
Norwich	4 %	3+ %	1 %	.....	..	.....
				66,500		398,510

*About. †Below. ‡Over. [1] Including the Northern system

[2] Including the Northern system and estimating the savings at ¾ of 1%, the lowest amount named in the schedules. The savings at ⅞% would be £171,500.

Labor

The hours and wages of motormen and conductors on the public and private systems are shown in Table 13. The hours are 54 to 60 per week for the municipalities against 70 for the companies. In London the County Council pays higher wages on the average than the London United. Outside London, Glasgow, Manchester and Liverpool pay minimum wages (averaging the rates for conductors and motormen) from 5.50d. to 5.62d. per hour against 3.90d. to 4.13d. for Dublin, Norwich and Bristol,[8] and maximum wages averaging 6.25d. to 6.95d. against 4.37d. to 5.25d. For the municipalities as a group the figures are 32s. 8d. per week, and 5.59d. to 6.89d. per hour, against 30s. 1d. per week and 4.46d. to 5.19d. per hour for the companies.[8]

TABLE 13.—HOURS AND WAGES OF MOTORMEN AND CONDUCTORS.

	Hours per Week.	Scale of Pay.[1] Per Week. Maximum.	Per Hour. Minimum.	Per Hour. Maximum.
		s d	d	d
Glasgow	54	31	5.60	6.95
Manchester	54	31	5.62	6.87
Liverpool	60	31 3	5.50	6.25
London C. C.	60	37 6	5.75	7.50
Municipalities	57	32 8	5.59	6.89
London United	70	38 6	5.40	6.60
Dublin United	70	28 3	3.90	5.25
Norwich	70	28	4.13	4.75
Bristol[2]	70	25 6	4.03	4.37
Companies	70	30 1	4.46	5.19

Profits.

The profits on operation for the municipal systems amounted in 1905 to £974,616 against £345,753 for the companies, and the net profits were £743,752 for the public systems, against £251,839 for the companies (Table 14). The municipal systems have good areas, and are well managed, so that they realize large profits, although the fares are very low, averaging on the whole about two-thirds of the company rates, and in some cases about half the company fares for the same distance (see Table 18). The important point here is the *distribution* of profits. The profits of the municipal tramways are devoted to public purposes. They go into the public treasury, or they are used to pay for improvements or to cancel the bonds so that the people may own the systems free of debt. Most of the profits of the companies go in dividends to a few stockholders.

How great a difference there is between public and private tramway systems in respect to the diffusion of profit appears from

[8] From Schedule II., where the data are given in detail for each class separately.

[1] Averaging the data given in Schedule II., for the two classes, motormen and conductors.

[2] Data obtained in Bristol by this sub-committee.

the data of Table 15. Leaving out Norwich (where the fair basis of comparison is absent for the reason stated in the star note) the population of the cities who get the benefit of public tramway profits used in paying off capital debt, reducing charges, etc., number 40 to 400 times more people than the groups of company stockholders who get the profits of existing companies, or the groups that did get the profits of the companies replaced by municipal managements in the public tramway districts.

The portion of profits (less than one-seventh) used to relieve taxation also benefits a much larger body than the stockholders. As every one who pays house rent or room rent is really a taxpayer, the number of persons interested in the reduction of the tax rate is very large, and if the Manchester theory noted above is correct, the whole population is benefitted by the reduction of taxes, whereby capital is attracted to build up the industries of the city, give employment to labor, and increase the business of merchants, lawyers, doctors, and every class in the community.

TABLE 14.—PROFITS AND THEIR USE.
(Schedule Figures for 1905.)

	Average Fare.	*Income.*	*[1]Working Expenses.*	*Profits on Operation.*	*[2]Net Profits.*	*Disposition of Net Profits.*	
						Depreciation and Reserve Funds.	*Relief of Taxation.*
	Cents.	£	£	£	£	£	£
Glasgow	1.88	764,791	392,602	372,189	319,401	293,510	25,000
Manchester	2.38	631,955	414,580	217,375	157,124	106,286	[3]51,000
Liverpool	2.22	557,055	375,521	181,534	131,255	105,935	25,320
London C. C.....	1.98	677,982	474,464	203,518	135,972	126,716	.....
Municipalities ..	....	.....	.....	974,616	743,752	632,447	101,320
							Dividends.
London United....	2.88	301,350	173,683	127,667	89,259	10,000	[4]78,706
Dublin United.....	2.48	267,864	144,846	123,000	82,942	11,500	70,200
Norwich	2.25	35,020	25,013	10,007	7,589	1,000	[5]6,600
Bristol	2.29	256,742	171,662	85,080	73,803	12,053	61,750
Companies	....	.....	.....	345,753	253,593	34,553	217,256

Since the beginning of municipal operation in the four cities under consideration, over $25,000,000 of net earnings from the public tramways have been devoted to public purposes, while about $14,000,000 have been devoted by the companies to the private purposes of little groups of stockholders.

[1] Including taxes.

[2] After deducting interest on loans, rent of leased lines, way leaves, etc., and adding interest from investments and bank balances; this addition amounts to £3,113 for Glasgow, £1,869 for Manchester, £9,573 for Liverpool and £222 for the London County Council (Schedule IV., M. 1).

[3] The sum of £4,043 was spent on street improvements, making with some small miscellaneous items about £5,000, so that £5,000 was taken from the surplus profits of previous years to make up the £51,000 in aid of rates.

[4] The dividends paid by the London United were 8% in 1902 and 1903, 6% in 1904 and 3% in 1905. (Schedule IV., Table M. 1, note 10.)

[5] Including a small amount transferred from surplus profits of preceding years.

The profit ratios (Table 16) are all favorable to the municipalities. The profit per passenger is lower than for the companies, because of the lower fares charged by municipalities; while their average profit per mile of line and per car mile and their per cent. of profit to outlay, liabilities and tangible assets, are all much greater than the average for the companies, showing economical management and low capitalization. In view of the higher rate of wages paid by the municipalities, these profit ratios are specially significant.

TABLE 15.—INCIDENCE OF PROFITS.

	Net Earnings. 1906. £	*Sum of Net Earnings in the Municipal Period.* £	*Years Covered.*	*Population of City, 1906, Est.*	*Number of Stockholders in Former Company or Present One.*
Glasgow	369,415	2,459,617	1894-1906	835,625	1800*
Manchester	230,146	812,297	1901-1906	637,126	2500*
Liverpool	181,535	1,228,868	1897-1906	739,180	1750*
London C. C.	212,183	851,068	1899-1906	[1]4,536,541	....
Municipalities	.....	5,351,850	.....	6,748,472	....
London United	126,036	467,400	1902-1906	[2]400,000	2500*
Dublin United	122,712	970,144	1894-1906	320,000	5000*
Norwich	9,303	32,630	1903-1906	117,958	9*
Bristol	85,079	1,409,892	1894-1906	363,223	....
Companies	.....	2,880,066	.....	1,201,181	....

TABLE 16.—PROFIT RATIOS.

(Profits on Operation, Schedule IV.)

	Miles of Line. £	*Per Car Mile.* Cents.	*Per Passenger Carried.* Cents.	*Per Cent. of Profit to Income.*	*Per Cent. of Profit to Outlay.*	*Per Cent. of Profit to Liabilities.*	*Per Cent. of Profit to Tangible Values*
Glasgow	5,067	10.2	.92	49%	13.5%	20.5%	14.1%
Manchester	2,548	7.5	.82	34	13.4	12.6	14.0
Liverpool	3,021	7.2	.73	33	9.3	10.4	11.1
London C. C.	4,354	7.0	.59	30	7.7	8.3	....
Municipalities	3,670	7.9	.77	37%	10.9%	12.6%	13.2%
London United	3,360	8.4	1.25	42%	4.7%	3.7%	10.6%
Dublin United	2,486	8.2	1.16	45	6.8	5.9	10.9
Norwich	676	4.4	.66	29	3.0	2.9	4.5
Bristol	3,017	6.7	.91	33	6.4	6.7	....
Companies	2,573	7.2	1.09	39%	5.6%	4.9%	10.2%

[1] Figure for 1901.

[2] Only 4 miles of the London United System are in London; most of the lines are in Middlesex and Surrey, so the population of the area served by the lines is taken.

*The number of stockholders for the London United, Dublin and Norwich are given in Schedule IV. The 9 shareholders in the Norwich company represent the General Electric Traction Company, which took all the Norwich shares. The Dublin and London United shares were put on the market. The number of shareholders in the former Glasgow company is stated as about 1,800 in the more prosperous years, and about 1,300 at the close. The Liverpool number is estimated by the present management at 1,500 to 1,750 for the former company.

The Price of Service.

Transit charges are judged in British cities by the minimum fare, the average fare, and the distance given for various fares, especially the average distance for a penny (2 cents), which is the fare the mass of the people pay.[9]

We have already examined the average fare in Section I. The minimum fare in all but one of the municipal systems is one-half the company minimum. All the cities have a ½d. (or 1 cent) fare for short distances (half to three-quarters of a mile) except Liverpool. None of the companies have any fare lower than 1d. or 2 cents for the ordinary passenger traffic. Comparing Dublin and Glasgow, the two systems that are nearest on all fours, we find that the Dublin charges within the rates on which substantially all the traffic moves (see Table 17) are 50 per cent. to 100 per cent. above the Glasgow rates for the same distances. Dublin gives an average of 1.53 miles for 1d. against 2.3 miles in Glasgow, and 3.07 miles for 2d. against 4.59 miles in Glasgow. That is, Glasgow gives 50 per cent. more for the money, or Dublin charges 50 per cent. more than Glasgow for the same distance. And for short rides that can be had for ½d. in Glasgow, the Dublin charge is 1d. or 100 per cent. above the Glasgow rate. The average passenger who rides from 1.6 to 2.3 miles, or from 3 to 3½ miles also pays 100 per cent. more in Dublin than in Glasgow. From 3½ to 4½ miles of the average routes the Dublin charge is 3d. against 2d. in Glasgow; from 4.85 to 5.85 miles the Dublin rate is 4d. against 2½d. in Glasgow, etc.

For the municipalities as a group the average distance for 1d. is about 2.2 miles, against 1.6 miles for the companies as a group; that is, the cities give their passengers nearly 40 per cent. longer rides for a penny than the companies. On account of the stage divisions and the lack of intermediate fares, 1½d., 2½d., 3½d., etc., on most of the company systems, the average charges are considerably more than 40 per cent. above the municipal charges for the same distance.

There are no free transfers on either the public or private tramways. Return trip tickets for working men are required by law, but the return is paid for. The tickets supplied in Norwich to passengers who wish to take a second route, are not free transfers, for both routes must be paid for at full rates when the ticket is bought.

[9] The following data from Schedule IV. show how the traffic is divided:

TABLE 17.—PASSENGERS CARRIED—PERCENTAGES AT DIFFERENT FARES.

Rates of Fare.	*Glasgow.*	*Manchester.*	*Liverpool.*	*London C. C.*	*London United.*	*Dublin.*	*Norwich.*
½d.	29.9%	5.4%	.....	36.0%	No half penny fare.		
1d.	60.2%	71.9%	89.3%	47.1%	71.6%	81.1%	88.2%
1½d.	6.7%	11.0%	1.0%	9.1%	.....	.....	6.8%
2d.	1.9%	7.1%	9.1%	5.0%	21.1%	14.7%	4.3%
Higher fares	1.3%	4.6%	.6%	2.8%	7.3%	4.2%	.7%

TABLE 18.—AVERAGE DISTANCE IN MILES FOR DIFFERENT FARES.

Fare.	Glasgow.	Manchester.	[1]Liverpool.	[2]London C. C.	Surrey.	London & Middlesex.	[3]Dublin.	Norwich.	[4]Bristol.
½d.	.58	.72	....	.64	....	.....	....	....	.....
1d.	2.30	2.10	2.40	1.85	1.84	2.07	1.53	1.46	1.8
1½d. ...	3.48	2.61	....	2.62	....	.....	....	About	General
2d.	4.59	3.34	4.80	4.05	3.70	4.17	3.07	1	scheme
2½d. ...	5.88	4.03	....	4.80	....	.....	....	mile	1d.
3d.	6.90	4.68	7.15	5.98	5.42	6.18	4.85	for	a
3½d. ...	8.11	5.43	....	....	....	.....	....	1d.	mile.
4d.	9.19	6.45	9.50	....	7.21	8.80	6.26		
4½d. ...	10.15	....	....	....	....	.....	....		
5d.	[5]10.77	....	....	....	8.90	10.16	9.30		
5½d. ...	[5]11.59	....	....	....	....	.....	....		
6d.	12.93	....	....	....	....	11.16	....		

Some of our street railway people are fond of criticising the British tramways because of the graded system of fares which they continue to use. The question of graded fares versus uniform fares is a very interesting one, but the current American criticism of the graded fare does not touch the question of public or private management, but applies to both, since both use the graded system in Great Britain.[10] The people like the graded plan. While we were

[1] Schedule III. gives only the 2.4 miles average for the 1d. fare. The averages for the other fares have been worked out from the route book and the large tramway map published by the department.

From the centre of the city out Liverpool has a sort of zone system with only two fares on any of the radial lines from the centre (Pier Head, Old Haymarket, or Castle street); 1d. carries the passenger beyond the 2-mile circle and 1d. more carries him to the end of the line on any of the suburban routes. The 3d. and 4d. fares are for journeys across the city from one suburb or outlying district to another through the centre.

[2] The figures for the London C. C. column are approximate only.

[3] Schedule IV. (from which this table is taken except as otherwise noted) leaves the Dublin column blank and says: "No data available. About 1¼ miles for 1d." This we think does not do Dublin full justice. There are 33 penny stages ranging from 1.11 to 2.62 miles (only 1 stage being above 2.1 miles). The 33 routes add up to 50.39 miles, or an average of 1.53 miles for 1d., against 2.3 in Glasgow, 2.4 in Liverpool, 2.5 in Sheffield, etc. Dublin has also 29 twopenny stages averaging 3.07 miles; 10 threepenny stages averaging 4.85 miles; 6 fourpenny routes averaging 6.26 miles, and 2 fivepenny rotes averaging 9.3 miles.

[4] The Bristol data are from examination of the routes by this subcommittee. For the 1d. distance the statement of the company that it charges ¾d. per mile is taken, although a considerable number of actual routes examined come much closer to the 1d. a mile scheme which the conductors on the cars agreed in stating was substantially the plan in use.

[5] These schedule figures do not precisely agree with those obtained direct from the tramway list of stages furnished by the department, but the difference is small and unimportant. (See "Glasgow" in Section II. above.)

[10] The municipal tramways of Hull have had a uniform 2-cent fare for half a dozen years and the tramways make a good profit and pay £50,000 a year in relief of taxation, but the case is not regarded as a guide for cities like Glasgow and Manchester, for the Hull system is a small one, having only 8 miles of line in 1901, and 13.6 miles in 1906. Bradford's public trams have a universal 2-cent fare before 8:00 a. m.,

in Manchester, a member of our Commission discussing the graded fares said to the chairman of one of Manchester's public service committees: "In my city you can ride 12 miles for 5 cents." "Yes," replied the chairman, "And you can ride 12 yards for it, too."

Service and Equipment.

In view of the current criticisms of British tramways based on comparisons with the street railways of the United States, it is necessary to remark that the inferences commonly drawn from such comparisons, in respect to public and private ownership, are entirely illogical. For example, we are told that street railways in America are superior to the municipal tramways of Great Britain, in speed, mileage per capita, extent and character of service, distribution of population, etc., and it is inferred that the alleged superiority of our street railways is due to private ownership. Comparisons of British and American tramways are interesting and valuable as throwing light on the relative advantages of different systems of transportation, and the relative progress of the two countries in the art of electric traction. But the common inference from the comparisons of speed, mileage, wages, rides per capita, etc., that they prove the superiority of private management, is wholly invalid, because the alleged inferiorities apply to private as well as to public plants in Great Britain, and because the said inference ignores the mixture of causes, the differences in transit conditions and in law, and the influence of national causes.[11]

with an average haul of 4.16 miles. On the Sheffield tramways 2 cents will carry the passenger the whole length of any route—that is the maximum fare, but it is not a uniform fare because they also have a 1-cent fare. Most of the tramways, both public and private, have a much more complex tariff than the two-fare plan of Sheffield. It must be remembered that they are dealing with British conditions and that circumstances alter cases. The traditions and habits of thought and action of the bulk of the people must be taken into account in the management of the tramways. The mass of the people in English cities have to count the pennies much more carefully than our people do. Their time is less valuable to them and their money more valuable, so they would look at "tuppence haypenny" a good while before they would pay it out for a short ride on the trolleys, as our people do. Our street cars in many cases carry the ordinary passenger a longer distance for a nickel than the British cars, public or private. But it must not be forgotten that our street railways charge 5 times as much for short rides as the municipal tramways of Glasgow, Manchester and London charge and 2½ times as much as the British companies.

[11] The lower speed of English tramways is not due to the form of ownership but to legal regulations which strictly limit the speed and which apply to private tramways in Great Britain as well as to public trams. As to mileage, the public tramways have extended their lines as a rule much more than the companies in Great Britain, but the mileage per thousand inhabitants is not so great as in the United States and does not need to be. British cities are much more compact than American cities; and the steam railways under compulsion of law to establish low fares for workmen have developed a large suburban traffic at very low rates, so that for various reasons a lower tramway mileage per thousand of population is required in Great Britain than in the United States. As to the effect of national differences, we may note the fact

If our street railways were ahead of the public tramways in Great Britain, but not ahead of British company tramways, or not so much ahead of them as of the public trams, it might be fairly inferred that the superiority was due in part at least to private ownership. But the reverse of this is the fact—our street railways as a rule are further ahead of the private tramways of Great Britain in respect to speed, mileage, wages, etc., than they are in comparison with the public tramways. So the fair conclusion is that such superiorities as our street railways have, do not exist because of private ownership, but in spite of it. They are due to national differences, higher speed limits, greater areas of cities, superior mechanical development of the United States, etc. The superiorities in speed, mileage, wages, rides per capita, etc., are American, not private. If they attached to our plants because they are privately owned, and not because they are American, they would attach to private plants in Great Britain also, which is not the case. Our street railway superiorities are due to the same national causes that make our buildings, telephones, factories, stores, and schools, superior to their British counterparts.

If street railways in the United States were public property, there is no reason to believe they would adopt the graded fare, or the English wage level or speed limitations, or have the same mileage per thousand, or rides per capita as the British roads. If the same men who are managing street railways here for private companies were managing the roads for the cities, under fair political conditions, they would still excel the British roads in speed, mileage, wages, rides per capita, etc., as much or more than they do now.

If our 5 cent fare were compared with the 1 and 2 cent fares of municipal tramways in Great Britain, or the 2 to 3 cents cost of operation per passenger on our street railways were compared with Glasgow's cost of 1 cent per passenger, the opponents of municipal ownership would see very clearly that such comparisons, leaving out of account the national difference in wage levels and the system of

that a comparison of the buildings, elevators, telephones, factories, farms, commercial enterprises, etc., of the two countries shows a great superiority on the American side, although these things are subject to private ownership in both countries. Our public schools also far surpass the British system of education.

To show that American street railways are ahead of British tramways in certain respects does not prove anything in regard to public or private ownership, but only that the United States is ahead of Great Britain in some ways, especially in what relates to mechanical development. How backward Great Britain is in the development of transportation as compared with the United States, is shown by the fact that 46 British cities of 25,000 to 100,000 population, and 2 cities of 100,000 or more, were recently reported as being without street railways, either public or private, and 295 localities of 8,000 to 25,000 population were in the same condition. In the United States there were only 21 municipalities of the latter class without street railways, and none of the higher classes, above 25,000 population (Census Report on Street Railways, 1902). It is a good illustration of our national mechanical advancement, and Great Britain's national mechanical backwardness. Neither companies nor municipalities undertake to fill all the industrial opportunities which would be filled in the United States.

uniform fares over large areas, would be wholly unfair, and yet they resort to equally improper comparisons in respect to speed, mileage, wages and other elements of service.

The true method of arriving at just conclusions respecting the effect of the form of management upon the service, is to eliminate the influence of nationality by comparing public and private systems in the same country. Moreover, aside from any question of ownership, British tramways, public and private, must in the final analysis, be judged by British standards—not by American standards. Our street cars run faster, carry more strap passengers, and kill and injure more people than the street cars, public or private, in any other country. Our people seem to like this, but the English would not. The conditions and habits of the people are different in the two countries, and these differences must be taken into account in the management of the tramways, and in the judgment of them.[12] The successful tramway is the one that meets the needs of the people in its district, and gives at reasonable cost a service in accord with their habits and desires.[13]

[12] The graded fares, double-deck cars, low speed, absence of heating appliances, comparatively small mileage, etc., may not suit American conditions, but they appear to be adapted to British conditions, at least both public and private tramway systems in Great Britain are subject to all these limitations, if they are to be regarded as such, so that a comparison of British tramways with our street railways in relation to such matters constitutes no ground for criticism of municipal management in Great Britain. The opponents of public ownership often refer to the graded fares, unheated cars and low speed as arguments against municipal ownership, but such a use of the facts is clearly fallacious since the private companies in Great Britain are in the same condition. The climate is milder than ours and the people are accustomed to much less heat than we are, keeping their rooms 8 or 10 degrees cooler than ours ordinarily, so that the heating of cars is not essential as it is with us. The speed is fixed by law. And the graded fares are adapted to the habits and economic conditions of the people. In the matter of suburban extensions, the municipal managements, as appears elsewhere, have shown far greater enterprise than the companies have. As to the double-deck cars that are so common on British lines, the English like them, although they might not suit our people, who object to climbing spiral stairways, and might want an elevator on every car. The English public do not mind the stairs and ride outside all winter, even when the upper deck is not enclosed with glass, as is coming to be the custom on some of the best municipal systems. The double-deck plan is not only popular in Great Britain but it increases the carrying capacity, reduces the number of cars required, diminishes the street space occupied by tram cars and facilitates unloading so that the stoppage time necessary is considerably less with the British double-deck cars than with our single-deckers.

[13] Upon this fundamental test it is very doubtful if our railways can claim superiority to the British tramways. The street railways of New York, Chicago, Boston and Philadelphia are much further from meeting the needs of transportation in our cities than the tramways of Glasgow, Manchester, Liverpool, Dublin and Bristol are in relation to the needs of the cities they serve. Our street railways do not even pretend to run enough cars to accommodate public travel. Crowding to suffocation at the busy hours and quantities of people waiting on the streets unable even to get standing room are parts of the daily program in our cities. If the systems were municipal the protests of

The service is good according to British standards on all the systems we are examining, and in some of them the service is excellent in most respects, even according to American standards. A noted railroad president from the United States, after going over the Glasgow system, said with emphasis: "This is the finest street railway system I ever saw." He was greatly pleased with the handsome double-deck cars, the beautiful car sheds and power house, and the excellent management everywhere displayed. He had just come from a look at the Dublin tramways, which are very well managed, probably the best private system in the United Kingdom, so that this spontaneous comment has a special relevancy to this comparative study.

The car service is frequent on all the municipal systems, and fairly so on most of the company systems, and the passengers are not kept waiting on the corners except in case of the London United and London County Council lines in rush hours. In Glasgow 466 cars per hour pass a given point on Jamaica street, and on Saturdays, 516 cars—15 seconds headway on week days, and 13.8 seconds on Saturdays (Schedule III). The headway on the London United, according to the company's published statement, is as follows: On the London and Middlesex system a 2-minute service on one route, a 2½-minute service on another route, a 6-minute service on two routes, and a 10-minute service on four routes. On the Surrey system an 8-minute service on one route and a 10-minute service on five routes. The Bristol company says in its official handbook: "Cars run at short intervals, seldom exceeding 10 minutes, and sometimes on certain lines, during the busy hours of the day, as often as every minute."

There is very little standing in the cars. In London and Norwich the police regulations forbid it, and in other cities public sentiment and municipal policy are almost as prohibitive. The general principle in Great Britain seems to be that a fare calls for a seat as well as for transit.

The speed of British cars is low compared with ours. But legal regulations prohibit high speed on both public and private tramways, and neither are to blame for the low speed they are compelled to observe. The speed limits are fixed by the Board of Trade, and the narrow streets, together with British caution and regard for safety (which are abnormally developed according to our transportation standards) make it impossible for the street railways to equal the speed of our cars. Table 19 shows the special limitations placed on the tramway systems under consideration.

the people would probably have led to relief long before the crowding reached its present density, but protests to the companies have comparatively little weight as long as a high percentage of strap passengers means a higher percentage of profit. Of course the transportation problem in New York and Boston is more difficult than in any British city except London, but the companies are not doing what they might do and what a municipal management undoubtedly would do to relieve the pressure.

TABLE 19.—SPEED AND ITS LIMITS.
(See Schedule III.)

	Legal Maximum per Hour. Miles	*Actual Average Miles.*
Glasgow	8 in city; 16 outside	7 to 9
Manchester	8, 10, 12, 14, 16	7.1
Liverpool	8, 10, 12, 14	"No data"
London C. C.	16	9
London United	14	[1]6.6 to 8.4
Dublin United	7 in city; 8 to 16 outside	"No data"
Norwich	.....	"No data"
Bristol	.....	"No data"

Mr. John Young, the first manager of the Glasgow trams, told the writer that the railroads exerted their influence and used persuasive arguments about narrow, crowded streets, and the importance of safety, etc., in order to retain the 8-mile limit per hour and secure its enforcement, so as to keep the tramways from competing too vigorously with the railroads. The actual speed is, of course, somewhat below the legal rate, because of stops. If a car cannot go faster than 8 miles an hour, the time lost in stopping and starting will bring the actual distance per hour below 8 miles.

There is no all-night service except on the London County Council system. The average hours of service per day for the companies, as a group, are 18.5, while the average for the public tramways is 20.25 (Table 20).

TABLE 20.—HOURS OF SERVICE.

Glasgow	[2]20.	Dublin United	18.
Manchester	18.	Norwich	16.
Liverpool	19.	Bristol	18.
London C. C.	24.	London United	22.
Average	20.25	Average	18.5

One of the questions in Schedule III. is this: "Is the general morale and discipline of employees good, bad or indifferent?" The answers are:

"Glasgow, very good."
"Manchester, good."
"Liverpool, very good."
"London C. C., good."
"London United, good."
"Dublin, yes."
"Norwich, yes."

"Very good" is clear, and so is "Good," and the "Yes" for Dublin and Norwich means good, though one unacquainted with the facts might not be sure whether "Yes," in answer to the question just quoted, would mean good, bad or indifferent, or all three.

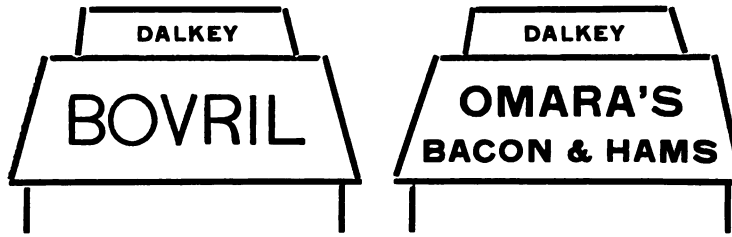
Advertisements are not allowed on the cars in Glasgow or Manchester. Each city, for esthetic reasons, forgoes $50,000 a year

[1] From the published routes and times of making the journeys.

[2] The Glasgow reports call their service a 16-hour service, but they are estimating the average daily service for the whole body of cars in use. The cars begin to run at 4:30 a. m. and end at 12:30. This is a 20-hour service on the principle used in calculating the hours for the other systems. If Glasgow's service is to be reckoned at 16 hours Bristol would be about 15, London United 18 and London County Council 19 or 20 at the outside.

which it could obtain in a lump for the privilege of advertising on the cars. The managements deal with the people's carriages in respect to dignity and beauty on somewhat the same principles that a business man would apply to his own private carriage if he were asked to sell advertising space on it for Carter's Little Liver Pills, Taddy's Tobacco, etc.

The other systems allow ads but they are kept in reasonable subordination except in Dublin, where the advertising comes nearer to the former company methods described in Section I., than is the case in any other system investigated by the Commission. "Branson's Coffee," "Epps' Cocoa," "Bryant & May's Matches," "Lipton's Teas," etc., appear in giant letters running the whole length of the car outside above the windows; and on the front above the door, the destination of the car is thrown completely in the shade by advertisements of "Bovril," "Van Houten's Cocoa," etc. Here are a couple of diagrams of Dublin car fronts made during the visit of the Commission:



One unacquainted with Bovril and Dalkey would naturally conclude that this first car was going to Bovril and would pass Dalkey on the way.

Equipment.

The equipment of all the systems under consideration is adequate, modern and efficient. Repairs are well kept up, the plants are clean and neat, the works are adequately ventilated, the machinery properly guarded, offices are conveniently located, and complaints are promptly attended to. Such is the evidence of Schedule III. in regard to all the systems.[14]

The Glasgow cars and buildings are especially attractive. The handsomest car barns visited by the Commission were in that city—simple, clean, airy, full of light, inexpensive and yet beautiful—they elicited the admiration of practically all the visitors. The power station is also one of the finest buildings of its class, and is splendidly equipped. The president of one of the greatest electric companies in the United States was asked: "What do you think of this station." He replied: "Beautiful! Beautiful!"

"Is there any fault to be found with it?"

"No; I am a great admirer of this class of work. We have got the finest station in the world in Boston, and this is very much like it."

[14] The London County Council's lines in process of construction, the schedule says, will be adequately equipped when completed.

The Commission's electric engineer from the United States, said, after a thorough study of the plant: "Fine station."

"Any criticism?"

"No; only it cost too much."

"Why?"

"Because it was put up in a rush. Big engines put up in a hurry always cost more than if built in leisurely."

Extensions.

In addition to the facts stated in the section dealing with tramway history, the data given in Schedule III., in relation to extensions, claim a place in this discussion.

The schedule says that all systems but one have adopted a liberal policy in regard to extensions. Norwich has made no extensions, but it must be remembered that the system is only three or four years old.

Under the question calling for "The total length of extensions during the past year" (1905), the schedule says: "Glasgow, 2.38 miles. For the year ending May 31, 1902, 8 m. 3 f.; 1903, 13m. 2 f.; 1904, 5 m.=26.71 miles. For the year ending May 31, 1906, about 7 miles"—a total of 36 miles in 5 years. The schedule figures for Manchester are "8.29 miles" during the past year (1905); "Liverpool, 2,487 feet of track." London County Council, no data; "London United, none opened; Dublin, none; Norwich, none."[15]

The schedule asks: "Has service been extended in advance of the demand in order to stimulate the growth of a district, or has it awaited demand?"

Answer of Commission's experts: "Glasgow; probably all of the extensions have been made prior to demand. Manchester; to a slight extent. Liverpool; policy has been liberal and the city seeks to be in advance of the demand. London United; extensions in advance of demand. Dublin; awaited demand. Norwich, none."

Extent of Service and Use.

The municipalities operated about double the length of line and of track operated by the companies; served about $2^2/_3$ times the population; ran over $2\frac{1}{2}$ times as many car miles, and carried four times as many passengers, twice as many per mile of track operated and $1\frac{1}{2}$ times as many per car-mile run.

The number of passenger journeys per capita of the estimated population served by the lines, is 166 for the municipalities against 107 for the companies. The lowest use for any municipal system is much above the highest use for any of the company systems; and the highest municipal use, that of Glasgow, is 60 per cent. above

[15] Extensions are not made in the United Kingdom as rapidly as in the United States, but any one who states or implies that this is due to municipal ownership leaves the facts behind him for the records show that municipal managements as a rule have made far greater extensions than the companies in the same country.

the London United, which has the maximum for the companies, and nearly 100 per cent. above the Dublin figure.*

Low fares, extended lines, ample facilities and frequent service count for the municipalities in the traffic statistics. Neither the records of present companies in other cities nor of former companies in the same cities show anything like the traffic results attained by the municipal managements.

TABLE 21.—TRAFFIC.
(Schedule Figures, 1905.)

	[1]Miles of Line Operated.	[1]Miles of Track Operated.	Car Miles Run.	Car Miles per Mile of Track.	Passengers. Per Mile of Track Operated.	Passengers. Per Car Mile Run.
Glasgow	73.45	147.5	17,943,595	121,651	1,327,237	[2]10.9
Manchester	85.3	146.2	14,123,124	96,601	867,995	8.9
Liverpool	60.1	104.	12,067,033	116,029	1,145,419	9.9
London C. C.....	46.74	84.85	[3]14,081,397	165,956	1,942,469	11.7
Municipalities..	265.59	482.55	58,215,149	120,641	1,257,000	10.4
London United...	38.	71.5	7,319,460	102,370	687,523	6.7
Dublin United...	49.47	97.	[4]7,223,243	74,466	519,577	7.0
Norwich	14.81	19.26	1,083,055	56,233	384,690	6.8
Bristol	28.2	51.48	6,177,554	119,999	879,840	7.3
Companies	130.48	239.24	21,803,312	91,136	636,433	7.0

[1] Schedule III. is incomplete as to the Norwich and London County Council mileage and omits Bristol, so the Board of Trade figures are taken to fill the gaps—for the year ending March, 1905, for the Council, and December, 1905, for the companies.

[2] Glasgow reports 11.02 passengers per car mile for the year ending May 31, 1906.

[3] Electric traction 10,931,396 car miles and 3,150,001 car miles horse traction (L. C. C. tramway accounts for year ending March 31, 1905).

[4] The company's statement of car mileage has been followed instead of the mss. copy of Schedule III., which appears to be incorrect on this point.

TABLE 22.—EXTENT OF USE.

City.	Passengers Carried, Schedule IV., 1905.	[1]Population Served.	Passenger Rides per Capita of Population Served, 1905.	[2]Passengers Carried, Board of Trade, 1906.	Passenger Rides per Capita of Population Served, 1906.
Glasgow	195,767,519	1,050,000	186	208,059,833	198
Manchester	126,900,875	900,000	141	133,923,032	149
Liverpool	119,123,644	837,000	142	119,123,644	142
London C. C....	[3]164,818,560	1,100,000	150	[4]183,512,421	167
Municipalities ..	606,610,598	3,887,000	156	644,619,830	166
London United..	49,157,895	400,000	123	49,157,139	123
Dublin United..	50,399,067	500,000	101	50,399,067	101
Norwich	7,409,126	117,000	63	[5]7,331,090	62
Bristol	45,294,177	400,000	113	45,294,177	113

Notes to Table 22 on p. 293.

* Americans have the riding habit more fully developed than the British people. The street railways of Boston, New York, Philadelphia, Washington and Chicago carry even more passengers per capita than the Glasgow trams and more than twice as many per capita as the Dublin Company or the London United.

Cost of Construction and Operation.

The capital outlay per mile of track owned, is less for the municipalities than for the companies (Table 24), while the value of plant and total assets per mile are greater for the municipal systems than for the companies, indicating that the company lines were not so well and economically constructed, or that the companies have charged up more to capital cost than they should, or that their lines have not been so well kept up as those of the municipalities, so that there is a greater depreciation or difference between the original cost and the present value.

TABLE 24.—CAPITAL COST.

	[*] Miles of Track Owned.	[2] Capital Outlay.	Outlay per Mile of Track Owned.	[4] Value of Plant per Mile of Track Owned.	[5] Total Tangible Assets per Mile of Track Owned.
Glasgow	136.62	2,763,381	20,227	16,938	19,221
Manchester	106.	1,616,804	15,253	11,253	14,608
Liverpool	99.2	1,955,433	19,712	11,128	16,429
London C. C.....	[1]84.85	2,623,693	30,922	.....	.....
Municipalities ...	426.67	8,959,311	20,999	13,489	16,980
London United...	71.5	2,702,013	37,790	14,946	16,802
Dublin United....	97.	1,809,956	18,659	10,595	11,623
Norwich	19.26	[3]331,654	17,219	8,327	8,848
Bristol	[3]51.4	1,324,061	25,760	.....	.....
Companies	239.16	6,167,684	25,789	12,020	10,450

[*] See note 1, Table 21.

[1] The L. C. C. data are for the Southern system only. About 2/5 of the track was still horse railroad in March, 1905. Plant not appraised by our engineers owing to transition state of the lines.

[2] From Board of Trade returns. Plant not appraised.

[3] From Schedule IV.

[4] Schedule III. Value of stock and equipment including land, buildings, machinery, cars, etc.

[5] Plant plus quick assets, materials on hand, cash in bank, funds invested, etc.

Notes to Table 22, on preceding page.

[1] The estimates of population served relate to the beginning of 1906 and are more nearly coincident with the Board of Trade returns for 1906 than with the schedule figures for Glasgow, Manchester and the L. C. C. 1905.

[2] From the Board of Trade returns dated 1906. This table affords an excellent illustration of the different effects of grouping the municipal years ending in the spring, with the company years ending with the preceding December, as the Board of Trade does, or with the company years ending with the following December as the Commission's engineers and accountants did for reasons previously explained.

[3] Southern system; carried by electric traction, 126,255,280 passengers, and by horse traction, 38,563,280; year ending March 31, 1905.

[4] Southern system, year ending March 31, 1906; 141,845,555 carried by electric traction, with 12,164,292 car miles, and 41,666,866 carried in horse cars, with 3,414,501 car miles.

[5] The difference in the Norwich figures from Schedule IV. and from the Board of Trade returns probably results from a difference in the treatment of the transfer passengers who buy two routes at once.

The working cost is shown in Table 25 (col. A); also the total cost (col. B), or working cost plus actual depreciation, way-leaves, rent of leased lines, and the return on capital liabilities which the system must make in order to be in sound condition, including interest, sinking fund, etc.; and the economic cost (col. C), or working cost plus depreciation, sinking fund, etc., and a reasonable interest on the value of the physical assets—the cost within which similar enterprises might be expected to come if the monopoly element could be eliminated or controlled and the undertakings placed on a basis of competition or regulation, which would make a moderate return on the value of actual assets sufficient.

TABLE 25.—COST OF THE SERVICE.

	A [3] *Operating Cost.*	B [4] *Total Cost.*	C [5] *Economic Cost.*
Glasgow	£392,602	£608,781	£678,150
Manchester	414,580	574,494	588,180
Liverpool	375,521	544,252	546,134
London C. C.[1]....	474,464	.....	.....
Municipalities ...	£1,657,167	£1,727,527	£1,812,464
London United...	£173,683	£387,101	£314,107
Dublin United...	144,846	345,747	282,414
Norwich	25,013	50,963	42,772
Bristol[2]	171,662	.....	.....
Companies	£515,204	£783,811	£639,293

[1] Horse and electric. [2] Figures taken from Board of Trade returns.

[3] Including taxes and maintenance but not renewals. Schedule IV. (1905).

[4] The total cost includes the working cost plus interest on the bonded debt and 2% on the bonds for a sinking-fund to cancel the debt within the life of the plant, also wayleaves, rent of leased lines, a 4% return on capital liabilities beyond the funded debt, and the actual yearly depreciation as determined by the Commission's engineers (Schedule III.). All these items must be covered in order that the tramway system, public or private, may be in sound condition. No plant can be considered sound that does not make provision for actual depreciation and for retirement of the debt within the life of the plant constructed with the money so secured. And no company would be regarded as in sound condition that continuously received less than 4% on its stock.

[5] The economic cost (or the fair cost within which the systems should come if the monopoly element were removed, taking wages, hours and traffic as they are) consists of the operating or working cost plus 2% on the bonded debt for a sinking fund (to clear off the debt within the life of the plant purchased with it), wayleaves, rent of leased lines, 4% interest on actual assets and 6% depreciation on the value of the plant. The valuations made by the Commission's engineers give an average annual rate of depreciation of 4.7% for Glasgow, 5.3% for Manchester, 5.5% for Liverpool, the same for the London United, 7.5% for the Dublin United and 5.9% for Norwich. The group average for the municipalities is 5.1% and for the companies 6.4% depreciation per annum. The average for the whole six plants is 5.6%. All these percentages are upon the capital cost as estimated by the engineers in Schedule III. When compared with present values in place of capital cost the actual amount of depreciation per year for the whole group is a little more than 6%, which has been taken as a uniform basis in estimating depreciation for the economic cost. This deprives the public plants of the advantage of their superior construction and lower actual rate of depreciation, but it enables us to compare all the plants with an average standard.

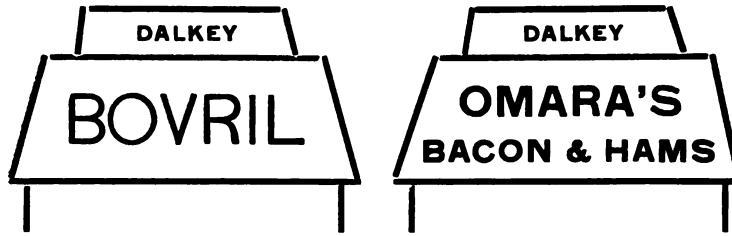
It will be noted that the total cost (col. B) for the municipal systems falls *within* the estimated competitive cost in every case, owing to low capitalization and low interest rates; while the total cost for the companies is in every case much above the economic cost, or what the cost should be on a reasonable competitive or non-monopolistic basis.

Turning now to the cost ratios (Table 26), we find the following facts: (1) The operating cost per mile of track is higher for the municipalities, owing to the shorter hours and higher wages of employees (see Table 13), and the large number of car-miles run per mile of track (Table 22). (2) The car-mile operating cost is higher for the municipalities, owing to the fact that they pay about 30 per cent. higher wages per hour than the companies (Table 13) and have about 50 per cent. more passengers per car-mile (Table 22), requiring more stops per mile and larger expense for maintenance, repairs, etc. The difference, 20 per cent. in the car-mile working costs for the companies and the municipalities is less than would be expected from the difference in wages and car-mile traffic, and the relations of these factors to the entire working cost, the tendency of these elements to increase the car-mile cost being partly overcome by good management and the larger number of car-miles run per mile of track. The operating cost per passenger is lower for the municipalities than for the companies; here the well-developed traffic of the municipal lines and their good management more than overcome the tendency of higher wages and shorter hours of labor to increase the cost.

(3) The *total* cost per car-mile is 28 per cent. higher for the companies than for the municipalities (Table 26). A reference to the estimated costs at which the various systems might fairly be expected to work under existing conditions as to wages and traffic if the monopoly element were eliminated, indicates that the companies *ought* to work at a slightly lower total car-mile cost than the cities. But instead of a lower total cost the companies have a much higher total cost per car-mile than the municipal systems, chiefly because of their overgrown capital liabilities. That is a far greater handicap for the companies than the higher pay accorded by the municipalities is for them. The municipalities can pay 30 per cent. higher wages and still beat the companies on total costs by keeping their liabilities within sight of real values. How great a handicap inflated liabilities constitute may be more fully realized when it is noted that the table shows the maximum cost for the cities and the minimum for the companies. A public plant only needs such return on capital liabilities as will cover interest and sinking fund to extinguish the liabilities within the life of the plant; whereas a company needs not only interest on its bonded debt and sinking fund for the capital liabilities representing the value of the plant, but fair dividends also on its stock. And no company would be permanently satisfied with less than the 4 per cent. dividends included in the total cost.

which it could obtain in a lump for the privilege of advertising on the cars. The managements deal with the people's carriages in respect to dignity and beauty on somewhat the same principles that a business man would apply to his own private carriage if he were asked to sell advertising space on it for Carter's Little Liver Pills, Taddy's Tobacco, etc.

The other systems allow ads but they are kept in reasonable subordination except in Dublin, where the advertising comes nearer to the former company methods described in Section I., than is the case in any other system investigated by the Commission. "Branson's Coffee," "Epps' Cocoa," "Bryant & May's Matches," "Lipton's Teas," etc., appear in giant letters running the whole length of the car outside above the windows; and on the front above the door, the destination of the car is thrown completely in the shade by advertisements of "Bovril," "Van Houten's Cocoa," etc. Here are a couple of diagrams of Dublin car fronts made during the visit of the Commission:



One unacquainted with Bovril and Dalkey would naturally conclude that this first car was going to Bovril and would pass Dalkey on the way.

Equipment.

The equipment of all the systems under consideration is adequate, modern and efficient. Repairs are well kept up, the plants are clean and neat, the works are adequately ventilated, the machinery properly guarded, offices are conveniently located, and complaints are promptly attended to. Such is the evidence of Schedule III. in regard to all the systems.[14]

The Glasgow cars and buildings are especially attractive. The handsomest car barns visited by the Commission were in that city—simple, clean, airy, full of light, inexpensive and yet beautiful—they elicited the admiration of practically all the visitors. The power station is also one of the finest buildings of its class, and is splendidly equipped. The president of one of the greatest electric companies in the United States was asked: "What do you think of this station." He replied: "Beautiful! Beautiful!"

"Is there any fault to be found with it?"

"No; I am a great admirer of this class of work. We have got the finest station in the world in Boston, and this is very much like it."

[14] The London County Council's lines in process of construction, the schedule says, will be adequately equipped when completed.

The Commission's electric engineer from the United States, said, after a thorough study of the plant: "Fine station."

"Any criticism?"

"No; only it cost too much."

"Why?"

"Because it was put up in a rush. Big engines put up in a hurry always cost more than if built in leisurely."

Extensions.

In addition to the facts stated in the section dealing with tramway history, the data given in Schedule III., in relation to extensions, claim a place in this discussion.

The schedule says that all systems but one have adopted a liberal policy in regard to extensions. Norwich has made no extensions, but it must be remembered that the system is only three or four years old.

Under the question calling for "The total length of extensions during the past year" (1905), the schedule says: "Glasgow, 2.38 miles. For the year ending May 31, 1902, 8 m. 3 f.; 1903, 13m. 2 f.; 1904, 5 m.=26.71 miles. For the year ending May 31, 1906, about 7 miles"—a total of 36 miles in 5 years. The schedule figures for Manchester are "8.29 miles" during the past year (1905); "Liverpool, 2,487 feet of track." London County Council, no data; "London United, none opened; Dublin, none; Norwich, none."[15]

The schedule asks: "Has service been extended in advance of the demand in order to stimulate the growth of a district, or has it awaited demand?"

Answer of Commission's experts: "Glasgow; probably all of the extensions have been made prior to demand. Manchester; to a slight extent. Liverpool; policy has been liberal and the city seeks to be in advance of the demand. London United; extensions in advance of demand. Dublin; awaited demand. Norwich, none."

Extent of Service and Use.

The municipalities operated about double the length of line and of track operated by the companies; served about $2^2/_3$ times the population; ran over $2\frac{1}{2}$ times as many car miles, and carried four times as many passengers, twice as many per mile of track operated and $1\frac{1}{2}$ times as many per car-mile run.

The number of passenger journeys per capita of the estimated population served by the lines, is 166 for the municipalities against 107 for the companies. The lowest use for any municipal system is much above the highest use for any of the company systems; and the highest municipal use, that of Glasgow, is 60 per cent. above

[15] Extensions are not made in the United Kingdom as rapidly as in the United States, but any one who states or implies that this is due to municipal ownership leaves the facts behind him for the records show that municipal managements as a rule have made far greater extensions than the companies in the same country.

the London United, which has the maximum for the companies, and nearly 100 per cent. above the Dublin figure.*

Low fares, extended lines, ample facilities and frequent service count for the municipalities in the traffic statistics. Neither the records of present companies in other cities nor of former companies in the same cities show anything like the traffic results attained by the municipal managements.

TABLE 21.—TRAFFIC.
(Schedule Figures, 1905.)

	[1]Miles of Line Operated.	[1]Miles of Track Operated.	Car Miles Run.	Car Miles per Mile of Track.	Passengers. Per Mile of Track Operated.	Passengers. Per Car Mile Run.
Glasgow	73.45	147.5	17,943,595	121,651	1,327,237	[2]10.9
Manchester	85.3	146.2	14,123,124	96,601	867,995	8.9
Liverpool	60.1	104.	12,067,033	116,029	1,145,419	9.9
London C. C.....	46.74	84.85	[3]14,081,397	165,956	1,942,469	11.7
Municipalities..	265.59	482.55	58,215,149	120,641	1,257,000	10.4
London United...	38.	71.5	7,319,460	102,370	687,523	6.7
Dublin United...	49.47	97.	[4]7,223,243	74,466	519,577	7.0
Norwich	14.81	19.26	1,083,055	56,233	384,690	6.8
Bristol	28.2	51.48	6,177,554	119,999	879,840	7.3
Companies	130.48	239.24	21,803,312	91,136	636,433	7.0

[1] Schedule III. is incomplete as to the Norwich and London County Council mileage and omits Bristol, so the Board of Trade figures are taken to fill the gaps—for the year ending March, 1905, for the Council, and December, 1905, for the companies.

[2] Glasgow reports 11.02 passengers per car mile for the year ending May 31, 1906.

[3] Electric traction 10,931,396 car miles and 3,150,001 car miles horse traction (L. C. C. tramway accounts for year ending March 31, 1905).

[4] The company's statement of car mileage has been followed instead of the mss. copy of Schedule III., which appears to be incorrect on this point.

TABLE 22.—EXTENT OF USE.

City.	Passengers Carried, Schedule IV., 1905.	[1]Population Served.	Passenger Rides per Capita of Population Served, 1905.	[2]Passengers Carried, Board of Trade, 1906.	Passenger Rides per Capita of Population Served, 1906.
Glasgow	195,767,519	1,050,000	186	208,059,833	198
Manchester	126,900,875	900,000	141	133,923,932	149
Liverpool	119,123,644	837,000	142	119,123,644	142
London C. C....	[3]164,818,560	1,100,000	150	[4]183,512,421	167
Municipalities ..	606,610,598	3,887,000	156	644,619,830	166
London United..	49,157,895	400,000	123	49,157,139	123
Dublin United..	50,399,067	500,000	101	50,399,067	101
Norwich	7,409,126	117,000	63	[5]7,331,090	62
Bristol	45,294,177	400,000	113	45,294,177	113

Notes to Table 22 on p. 293.

* Americans have the riding habit more fully developed than the British people. The street railways of Boston, New York, Philadelphia, Washington and Chicago carry even more passengers per capita than the Glasgow trams and more than twice as many per capita as the Dublin Company or the London United.

Cost of Construction and Operation.

The capital outlay per mile of track owned, is less for the municipalities than for the companies (Table 24), while the value of plant and total assets per mile are greater for the municipal systems than for the companies, indicating that the company lines were not so well and economically constructed, or that the companies have charged up more to capital cost than they should, or that their lines have not been so well kept up as those of the municipalities, so that there is a greater depreciation or difference between the original cost and the present value.

TABLE 24.—CAPITAL COST.

	[1]Miles of Track Owned.	[2]Capital Outlay.	Outlay per Mile of Track Owned.	[4]Value of Plant per Mile of Track Owned.	[5]Total Tangible Assets per Mile of Track Owned.
Glasgow	136.62	2,763,381	20,227	16,938	19,221
Manchester	106.	1,616,804	15,253	11,253	14,608
Liverpool	99.2	1,955,433	19,712	11,128	16,429
London C. C.....	[3]84.85	2,623,693	30,922	.....	.....
Municipalities ...	426.67	8,959,311	20,999	13,489	16,980
London United...	71.5	2,702,013	37,790	14,946	16,802
Dublin United....	97.	1,809,956	18,659	10,595	11,623
Norwich	19.26	[3]331,654	17,219	8,327	8,848
Bristol	[3]51.4	1,324,061	25,760	.....	.....
Companies	239.16	6,167,084	25,789	12,020	10,450

[1]See note 1, Table 21.

[3]The L. C. C. data are for the Southern system only. About 2/5 of the track was still horse railroad in March, 1905. Plant not appraised by our engineers owing to transition state of the lines.

[2]From Board of Trade returns. Plant not appraised.

[4]From Schedule IV.

[4]Schedule III. Value of stock and equipment including land, buildings, machinery, cars, etc.

[5]Plant plus quick assets, materials on hand, cash in bank, funds invested, etc.

Notes to Table 22, on preceding page.

[1]The estimates of population served relate to the beginning of 1906 and are more nearly coincident with the Board of Trade returns for 1906 than with the schedule figures for Glasgow, Manchester and the L. C. C. 1905.

[2]From the Board of Trade returns dated 1906. This table affords an excellent illustration of the different effects of grouping the municipal years ending in the spring, with the company years ending with the preceding December, as the Board of Trade does, or with the company years ending with the following December as the Commission's engineers and accountants did for reasons previously explained.

[3]Southern system: carried by electric traction, 126,255,280 passengers, and by horse traction, 38,563,280; year ending March 31, 1905.

[4]Southern system, year ending March 31, 1906; 141,845,555 carried by electric traction, with 12,164,292 car miles, and 41,666,866 carried in horse cars, with 3,414,501 car miles.

[5]The difference in the Norwich figures from Schedule IV. and from the Board of Trade returns probably results from a difference in the treatment of the transfer passengers who buy two routes at once.

The working cost is shown in Table 25 (col. A); also the total cost (col. B), or working cost plus actual depreciation, way-leaves, rent of leased lines, and the return on capital liabilities which the system must make in order to be in sound condition, including interest, sinking fund, etc.; and the economic cost (col. C), or working cost plus depreciation, sinking fund, etc., and a reasonable interest on the value of the physical assets—the cost within which similar enterprises might be expected to come if the monopoly element could be eliminated or controlled and the undertakings placed on a basis of competition or regulation, which would make a moderate return on the value of actual assets sufficient.

TABLE 25.—COST OF THE SERVICE.

	A [3] *Operating Cost.*	B [4] *Total Cost.*	C [5] *Economic Cost.*
Glasgow	£392,602	£608,781	£678,150
Manchester	414,580	574,494	588,180
Liverpool	375,521	544,252	546,134
London C. C.[1]....	474,464	.....	.....
Municipalities ...	£1,657,167	£1,727,527	£1,812,464
London United...	£173,683	£387,101	£314,107
Dublin United...	144,846	345,747	282,414
Norwich	25,013	50,963	42,772
Bristol[2]	171,662	.....	.....
Companies	£515,204	£783,811	£639,293

[1] Horse and electric. [2] Figures taken from Board of Trade returns.
[3] Including taxes and maintenance but not renewals. Schedule IV. (1903).
[4] The total cost includes the working cost plus interest on the bonded debt and 2% on the bonds for a sinking-fund to cancel the debt within the life of the plant, also wayleaves, rent of leased lines, a 4% return on capital liabilities beyond the funded debt, and the actual yearly depreciation as determined by the Commission's engineers (Schedule III.). All these items must be covered in order that the tramway system, public or private, may be in sound condition. No plant can be considered sound that does not make provision for actual depreciation and for the retirement of the debt within the life of the plant constructed with the money so secured. And no company would be regarded as on sound credit on that continuously received less than 4% on its stock.

[illegible] The economic cost, or the fair cost within which the systems should come if the monopoly element were removed, taking wages, hours and the like as they are, consists of the operating or working cost plus [illegible] bonded debt [illegible] sinking fund [illegible] the debt within the life of the plant, [illegible] wayleaves, rent of leased lines, [illegible] interest on [illegible] assets and the [illegible] in the value of the plant. The [illegible] made by the Commission's engineers give an average [illegible] for Glasgow, 3.3% for Manchester, [illegible] the Dublin United, 7.5% for the Dublin [illegible] Norwich. The group average for the [illegible] The average [illegible] depreciation per [illegible] All these percentages [illegible] as estimated by the engineers in Schedule III. When combined with present values in place of capital [illegible] the annual [illegible] for the whole group [illegible] which has been taken as a uniform basis in [illegible] the economic cost. This leaves the public plants in the advantage of lower operating maintenance and lower actual rate of depreciation, but enables us to compare all the plants with an average standard.

It will be noted that the total cost (col. B) for the municipal systems falls *within* the estimated competitive cost in every case, owing to low capitalization and low interest rates; while the total cost for the companies is in every case much above the economic cost, or what the cost should be on a reasonable competitive or non-monopolistic basis.

Turning now to the cost ratios (Table 26), we find the following facts: (1) The operating cost per mile of track is higher for the municipalities, owing to the shorter hours and higher wages of employees (see Table 13), and the large number of car-miles run per mile of track (Table 22). (2) The car-mile operating cost is higher for the municipalities, owing to the fact that they pay about 30 per cent. higher wages per hour than the companies (Table 13) and have about 50 per cent. more passengers per car-mile (Table 22), requiring more stops per mile and larger expense for maintenance, repairs, etc. The difference, 20 per cent. in the car-mile working costs for the companies and the municipalities is less than would be expected from the difference in wages and car-mile traffic, and the relations of these factors to the entire working cost, the tendency of these elements to increase the car-mile cost being partly overcome by good management and the larger number of car-miles run per mile of track. The operating cost per passenger is lower for the municipalities than for the companies; here the well-developed traffic of the municipal lines and their good management more than overcome the tendency of higher wages and shorter hours of labor to increase the cost.

(3) The *total* cost per car-mile is 28 per cent. higher for the companies than for the municipalities (Table 26). A reference to the estimated costs at which the various systems might fairly be expected to work under existing conditions as to wages and traffic if the monopoly element were eliminated, indicates that the companies *ought* to work at a slightly lower total car-mile cost than the cities. But instead of a lower total cost the companies have a much higher total cost per car-mile than the municipal systems, chiefly because of their overgrown capital liabilities. That is a far greater handicap for the companies than the higher pay accorded by the municipalities is for them. The municipalities can pay 30 per cent. higher wages and still beat the companies on total costs by keeping their liabilities within sight of real values. How great a handicap inflated liabilities constitute may be more fully realized when it is noted that the table shows the maximum cost for the cities and the minimum for the companies. A public plant only needs such return on capital liabilities as will cover interest and sinking fund to extinguish the liabilities within the life of the plant; whereas a company needs not only interest on its bonded debt and sinking fund for the capital liabilities representing the value of the plant, but fair dividends also on its stock. And no company would be permanently satisfied with less than the 4 per cent. dividends included in the total cost.

If our street railways were ahead of the public tramways in Great Britain, but not ahead of British company tramways, or not so much ahead of them as of the public trams, it might be fairly inferred that the superiority was due in part at least to private ownership. But the reverse of this is the fact—our street railways as a rule are further ahead of the private tramways of Great Britain in respect to speed, mileage, wages, etc., than they are in comparison with the public tramways. So the fair conclusion is that such superiorities as our street railways have, do not exist because of private ownership, but in spite of it. They are due to national differences, higher speed limits, greater areas of cities, superior mechanical development of the United States, etc. The superiorities in speed, mileage, wages, rides per capita, etc., are American, not private. If they attached to our plants because they are privately owned, and not because they are American, they would attach to private plants in Great Britain also, which is not the case. Our street railway superiorities are due to the same national causes that make our buildings, telephones, factories, stores, and schools, superior to their British counterparts.

If street railways in the United States were public property, there is no reason to believe they would adopt the graded fare, or the English wage level or speed limitations, or have the same mileage per thousand, or rides per capita as the British roads. If the same men who are managing street railways here for private companies were managing the roads for the cities, under fair political conditions, they would still excel the British roads in speed, mileage, wages, rides per capita, etc., as much or more than they do now.

If our 5 cent fare were compared with the 1 and 2 cent fares of municipal tramways in Great Britain, or the 2 to 3 cents cost of operation per passenger on our street railways were compared with Glasgow's cost of 1 cent per passenger, the opponents of municipal ownership would see very clearly that such comparisons, leaving out of account the national difference in wage levels and the system of

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that a comparison of the buildings, elevators, telephones, factories, farms, commercial enterprises, etc., of the two countries shows a great superiority on the American side, although these things are subject to private ownership in both countries. Our public schools also far surpass the British system of education.

To show that American street railways are ahead of British tramways in certain respects does not prove anything in regard to public or private ownership, but only that the United States is ahead of Great Britain in some ways, especially in what relates to mechanical development. How backward Great Britain is in the development of transportation as compared with the United States, is shown by the fact that 46 British cities of 25,000 to 100,000 population, and 2 cities of 100,000 or more, were recently reported as being without street railways, either public or private, and 295 localities of 8,000 to 25,000 population were in the same condition. In the United States there were only 21 municipalities of the latter class without street railways, and none of the higher classes, above 25,000 population (Census Report on Street Railways, 1902). It is a good illustration of our national mechanical advancement, and Great Britain's national mechanical backwardness. Neither companies nor municipalities undertake to fill all the industrial opportunities which would be filled in the United States.

uniform fares over large areas, would be wholly unfair, and yet they resort to equally improper comparisons in respect to speed, mileage, wages and other elements of service.

The true method of arriving at just conclusions respecting the effect of the form of management upon the service, is to eliminate the influence of nationality by comparing public and private systems in the same country. Moreover, aside from any question of ownership, British tramways, public and private, must in the final analysis, be judged by British standards—not by American standards. Our street cars run faster, carry more strap passengers, and kill and injure more people than the street cars, public or private, in any other country. Our people seem to like this, but the English would not. The conditions and habits of the people are different in the two countries, and these differences must be taken into account in the management of the tramways, and in the judgment of them.[12] The successful tramway is the one that meets the needs of the people in its district, and gives at reasonable cost a service in accord with their habits and desires.[13]

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[12] The graded fares, double-deck cars, low speed, absence of heating appliances, comparatively small mileage, etc., may not suit American conditions, but they appear to be adapted to British conditions, at least both public and private tramway systems in Great Britain are subject to all these limitations, if they are to be regarded as such, so that a comparison of British tramways with our street railways in relation to such matters constitutes no ground for criticism of municipal management in Great Britain. The opponents of public ownership often refer to the graded fares, unheated cars and low speed as arguments against municipal ownership, but such a use of the facts is clearly fallacious since the private companies in Great Britain are in the same condition. The climate is milder than ours and the people are accustomed to much less heat than we are, keeping their rooms 8 or 10 degrees cooler than ours ordinarily, so that the heating of cars is not essential as it is with us. The speed is fixed by law. And the graded fares are adapted to the habits and economic conditions of the people. In the matter of suburban extensions, the municipal managements, as appears elsewhere, have shown far greater enterprise than the companies have. As to the double-deck cars that are so common on British lines, the English like them, although they might not suit our people, who object to climbing spiral stairways, and might want an elevator on every car. The English public do not mind the stairs and ride outside all winter, even when the upper deck is not enclosed with glass, as is coming to be the custom on some of the best municipal systems. The double-deck plan is not only popular in Great Britain but it increases the carrying capacity, reduces the number of cars required, diminishes the street space occupied by tram cars and facilitates unloading so that the stoppage time necessary is considerably less with the British double-deck cars than with our single-deckers.

[13] Upon this fundamental test it is very doubtful if our railways can claim superiority to the British tramways. The street railways of New York, Chicago, Boston and Philadelphia are much further from meeting the needs of transportation in our cities than the tramways of Glasgow, Manchester, Liverpool, Dublin and Bristol are in relation to the needs of the cities they serve. Our street railways do not even pretend to run enough cars to accommodate public travel. Crowding to suffocation at the busy hours and quantities of people waiting on the streets unable even to get standing room are parts of the daily program in our cities. If the systems were municipal the protests of

important facts and impressions that would not have enriched the record of the Commission, if the National Civic Federation had not had the wisdom to include in its call possessors of expert knowledge and operating experience. Taken all together, there is enough information collected and recorded to enable us fully to answer the main question.

Information relative to British undertakings might be obtained by correspondence, did not the declared purpose and adopted method of the Committee forbid. The Committee of Twenty-one went to Europe to learn for itself the facts relative to English municipal trading and to free the American public from the necessity of accepting *ex parte* statements on this subject. Such information, if any, as we have obtained by correspondence or otherwise than from the examination of the Commission's investigators, must be accepted as *ex parte,* not endorsed by this Commission, and not a part of its record.

The comparisons and statements herein made of the results of Municipal and Private ownership of gas, electric light and water supply, are based on the facts observed by the Commission's investigators except as otherwise stated. In writing of the trolleys we have gone farther afield, and this because the trolley conditions and policies of Great Britain and America are so widely different that it seemed necessary to compare general British practice with general American practice, in order to arrive at any conclusions valuable in the United States. Had there been municipalized trolleys in America, we would have investigated them and have confined ourselves, in the discussion of trolley practice, to the facts developed by the investigation.

The mission of the Commission was to inquire into the results of municipal ownership as compared with private ownership. The results of the year 1905 were selected by the Commission for this comparison, it being the latest full year. It would have been interesting for the Commission to have gone deeply into the history of municipalization, but such a history, while of interest, would necessarily be of little value in determining the question whether to-day municipalization is or is not desirable. Whatever may have been the conditions existing twenty or fifty years ago, and their effect upon the question of municipalization at that time, we are interested in only as in other matters of history. The question put to us is—what are the conditions to-day, and how is municipalization meeting the expectations and justifying the boasts of its supporters? That question we answer by a presentation and interpretation of the facts observed and recorded by the investigators of this Commission.

A part of the general policy of the Commission was to select the best available examples of municipal ownership, and compare them with the best available examples of private ownership, attention being paid to the relative size, location and local conditions of the communities presenting these two forms of ownership. The municipalized industries investigated were selected by those mem-

bers of the Committee who were in general sympathy with the idea of municipalization; the company owned industries investigated in the United States were selected by those members of the Committee who were familiar with the private plants of this country; and there was an agreement among the members of the Committee that reasonable comparisons could be made of the results obtained by the two systems in the American cities selected. The private undertakings investigated by the Commission in Great Britain were all named by those who were in general sympathy with municipalization, except that a change was made from the Liverpool gas plant to the South Metropolitan Gas Company of London, at the suggestion of the members who were supposed generally to sympathize with private ownership.

The experts employed, where two worked together, were selected—one by the members of the Committee in general sympathy with municipal ownership, and the other by the members of the Committee in general sympathy with private ownership. Where there was but one expert the selection was made by the men in sympathy with municipal ownership. Thus Dr. Maltbie, reporting on Schedule 1, which relates principally to the statutory and legal provisions of the undertakings examined in Great Britain, a very important part of this subject, is well known to have been in general sympathy with municipalization. He had no associates in this work. Mr. Maury, the only water works expert employed, was the selection of the superintendent of the Cleveland municipal water works, a man at that time in sympathy with municipalization.

In reply to the very natural criticism and question, Why did the Commission go to Europe to study municipal ownership under social and political conditions different from those existing in the communities with whose good they are most concerned? it may be said that the Commission went abroad in deference to the wishes of those who argued that British municipal conditions are much better than American; are not better than might be attained in America; and that we would find under such conditions as do exist in Great Britain highly successful municipal ownership and operation, including a high degree of financial success, whatever we might find in the United States.

The writers of this analysis assented to the proposition that the municipal industries of Great Britain should be investigated for whatever of enlightenment, or of warning, might be had from a study of municipal trading under a monarchy, although they agreed with the comment credited to Professor John Gray by a noted writer on municipal ownership, "It (private ownership) is beyond any doubt whatever much more in harmony with the theory and philosophy of democratic government than municipal ownership."

As the ownership and operation of productive industries has not generally been recognized in this country as one of the functions of a municipality, those who now advocate it for America must accept the burden of proof. For, as Professor John R. Commons has said ("Municipal Affairs," 1897, and afterward

quoted by Professor Bemis in the latter's "Municipal Monopolies"): "* * * Municipal functions have increased very slowly. Cities have accepted the principle, just as every advocate must also do, that the burden of proof is against the assumption of new functions."

A proper analysis of the data collected leads necessarily to some discussion of the broad questions involved. As far as our space permits, we so analyze and discuss in the following chapters.

For the sake of convenience in determining the results of municipal ownership of street railways, water works, gas works and electric plants, we subdivide the subject and discuss under the following heads: Price and character of service, extent of use, cost of production, financial conditions and politics, character and efficiency of plants, welfare of employees, effect of private and municipal ownership on political conditions, and the effect of these conditions on each form of ownership.

These phases of the subject are of interest, simply as indicating an answer to the broad question, Does municipal ownership conduce to the ultimate good of the community? This is not a question of private gain or individual advancement. It is not a narrow question to be determined by local conditions in a particular town. It is a question of importance so great that its decision will affect not ourselves alone, but our descendants also. It will affect the health and happiness of our people, the welfare of our nation and the permanence of our democracy.

The answer involves no choice between municipal ownership and ownership by men uncontrolled in eagerness for self and thoughtlessness of the public. It involves no comparison of particular directors with particular municipal officials. It necessitates no wholesale condemnation of our municipal government. It requires honest, careful thought in comparing the results which experience, and our knowledge of human nature, teach us will be likely to flow from private enterprise, with the results that will be likely to flow from municipal ownership.

Public, or private, ownership of public service industries is advantageous to the community just in so far as it promotes the physical, mental and moral well-being of the citizens. On "health" in this broad sense depends our civilization, and there is no stronger factor than the proper development of our water works and gas works, our street railways and our electric lighting plants, in its production and cultivation.

On an adequate supply of pure water depend the cleanliness, the health, the self-respect and, to no small extent, the morality of every citizen.

Extended street railways with low fares for long distances mean a chance for the city worker to live in the country, where his children can be helped to strong, useful manhood and womanhood by days of exercise in fresh air and sunlight and by nights of quiet sleep; they mean less crowding in the city; for many a youth they mean freedom from the temptations to immorality and

crimes which lurk in the dark, crowded tenement districts of a city whose laborers must live within walking distance of their work; they mean the healthy growth of the minds and bodies of thousands of boys and girls whose lives will make or mar our land.

For those whose work requires the use of artificial light, an ever ready supply of gas or electricity means comfort and efficiency, and is a potent factor in preserving health.

But these important factors do not represent the full advantages of proper development of public services. Every moment saved by railway service, every moment saved by the convenience of gas or electricity, every moment gained by ability to read better, work better, play better, or live better is a moment available for the pursuit of happiness or for useful work. Every extension and improvement in transportation makes possible a wider distribution of the joys of life, means new chances for growth by intercommunication and experience, and leads to ever increasing social welfare, while every addition to the ease of using good water means a better chance for a general reign of cleanliness, which, proverbially, is next in merit to Godliness.

Therefore, to insure the most efficient conduct of these public service industries is of the highest importance.

Democratic government is but a man-made institution, set up by the majority to insure the existence of such conditions as it desires and approves. It depends for existence on men and men-made laws. If it is to continue it must be because it commends itself to the individuals governed.

To-day our cities maintain roads and sewers, school houses and police forces. These we all admit are proper governmental activities. Yet each year their exercise inclines many citizens toward socialism or toward anarchy. The driver and pedestrian find dirty, ill-paved streets. The child at school thinks he is worked too hard; the parent thinks his children are not taught enough. The householder and taxpayer thinks of ill-laid sewers. The law-abiding citizen complains that he is ordered about by the police when he is quietly living his useful life.

The wider the chances for such clashes between the government and the people, and the more unnecessary the clashes, the larger grows the force of those who want a change. Imagine the gas, electric lighting, and street railway industries in the hands of our cities, represented by officials who, at best, are fallible, like other men. Every laborer wanting more pay, every taxpayer thinking his money unwisely spent, every person waiting for a car, every man out of a job, every man with the slightest grievance in regard to any one of these services, would come nearer in sympathy with those malcontents who are not satisfied with our present form of democratic government, and who seek to substitute one of the extremes—socialism or anarchy.

Another threat to the permanence of our democracy, even more serious than that of the friction between government and governed, abides in the system of municipal ownership. It is the threat of

the tyranny of organized municipal employees, whose interest is to raise their wages by legislation and at the expense of other workers, and whose ability to make good their demands by the ballot is out of all proportion to their numbers. As a result of this class interest, the danger to the equal opportunity of all laborers, through individual, or union, effort to sell their labor for a fair price, has become so great in England that statesmen are seriously considering the advisability of disfranchising municipal employees. Several officials connected with the operation of Glasgow municipal industries, an official of the Electric Department at Liverpool, and many other officials of cities visited, told members of the Commission that there was a serious threat to the municipality from the organization of municipal workmen; and that they believe that Parliament, in order to protect municipal interests, would be compelled to disfranchise all municipal employees. If in Great Britain, with its restricted suffrage, affecting especially the working classes, this idea of total disfranchisement is obtaining place in the minds of thoughtful men—particularly men in official relation to existing municipal industries—what would be the danger in this country, where all may vote? In New York City are 46,000 city employees. If there were added the men necessary to operate the railway, gas and electric lighting services of the city the number would be increased to at least 80,000. If, as is often asserted, each voter who has a personal interest at stake can control at least one vote beside his own, a measure antagonistic to the interest of city employees would meet the interested opposition of some 160,000 voters, while a measure in their special interest would be supported by an equal number. Those acquainted with the political history of our cities will concede that this is no mere theorizing. Against this force, organized in the interest of a class, the other voters would have little chance. They would find themselves beneath the tyranny of a democracy, which is no less galling to the individual oppressed, and no less detrimental to the welfare of the state, than is the tyranny of a despot. The disfranchisement of any class of citizens in this country is unthinkable.

It is asserted by municipalizers that adding trading to government functions will increase the public interest in municipal government and attract abler and better men to governing positions.

Since the beginning of history, able and good men have sought to exercise the function of government. The determination and maintenance of justice, and the making and interpretation of law, are universally recognized as being worthy of the ability of the most able men, and the effect on the character of the individual member of the governing body is recognized as elevating. It is admitted that even inferior men elected to governing positions and having only honor and reputation to gain by the proper performance of their duties, generally rise to the dignity of their position, and perform their duties with zeal and integrity.

Also it is admitted that such positions are attractive to the best men in the community. How the function of gov-

ernment stands in the minds of people shown by the relative position it occupies in countries in which caste is recognized, as in Great Britain. The governing body is universally the highest class; then comes, ordinarily, the military, the ecclesiastical and finally the trading body. This is truly significant of the effect of adding trading to the duties of a governing position. Statesmanship is necessary to success in our governing bodies; ability to trade is necessary to success in trading operations. Rarely are the two qualities found highly developed in one person. We must have the statesmanship in our rulers—the ability to govern and protect the community, the ability to recognize justice, and the courage and wisdom to do justice. If we are handicapped in our efforts after these qualities by the necessity of finding them combined with an ability to successfully manufacture and trade, or to direct manufacturing and trading, the possible character of our council, our legislature and our congress is certain to deteriorate. Certain it is that, above all things, the people must desire efficiency and purity in their governors. To insure these qualities in their governors they must not only elect the best men possible to governing positions, but they must limit the number of their responsibilities, and reduce, as far as possible, the opportunity and the temptation of such men, when elected, to better their financial, political or social condition at the expense of their own honor and the welfare of their fellowmen. To give to these men the continuous command of the employment of many men and the making of many contracts is to submit them to continuous temptations in two directions:

First, by giving them the opportunity and temptation to build, or endeavor to build, a political machine, with the city employees as a basis, to perpetuate themselves or their friends or their policies. It is notorious that this evil now exists to a degree in American municipalities, with the present and necessary employees as a basis. How much greater the opportunity and disastrous the effect if the many gas, electrical and street railway employees were added to the number of city employees!

Secondly, it gives them the opportunity and the temptation to unduly favor contractors with the expectation of either financial or political advantage to themselves. Under such circumstances baser men will offer themselves as candidates for position. Men of the first class, indisposed to compete for office where there are opportunities for corruption, and where they subject themselves to villification and suggestion of improper motives, will not generally offer themselves as candidates. It is quite possible that men of high type will offer themselves for office under any system, when there are crying evils to correct, whether represented by so-called "grafting," by wastefulness, or by injustice in administration. But such men will do it unwillingly, at a personal sacrifice, and determined that the sacrifice shall be terminated at the earliest moment. All this is human nature—we may not doubt it. And there is little hope that such men, unacquainted with the intricacies of gen-

erating, advertising, selling and distributing commodities, will be able to detect and correct wasteful methods, or to prevent the "grafting" that may be represented by the employment of unnecessary or incompetent men, or the use of unnecessary or inferior material.

A good governor, whom the community would desire to continue in office, would not use the voting power of the municipal employees to perpetuate himself. A corrupt governor, whom the good citizens would desire to be rid of, would use this power for his own perpetuation, and no civil service system could protect the community against this baleful influence.

The fact is not overlooked that under the present American system of individualism there are, at intervals, franchise renewals and lighting contracts that may afford temptation and opportunity for blackmail and corruption. But these are not continuous. They are large matters. The public becomes interested. There are comparisons of prices and terms, conditions in other cities are quoted, public interest becomes keen, and betrayal of trust would be difficult and dangerous. The newspaper, and general, discussion of the proposition to lease the Philadelphia gas works is an instance of the way the public interests itself in matters pertaining to grants to public service corporations. And this proper attention to its interests upon the part of the public is becoming more and more marked. The indifference of the public to the general operation of municipally conducted industries was shown by the absence of interest in the making of contracts and in the daily operation of the Philadelphia gas works when the city operated the plant. Dr. Maltbie has remarked this absence of continuing interest in Great Britain.

There is little about municipal trading to attract men of the first class. A man who has been in business long enough to accumulate the competence he must accumulate before he can afford to give liberally of his time (as the aldermen in Great Britain are said to give) is too old to learn a new business. The complicated and highly technical electrical, physical and chemical processes of the lighting and transportation industries, with their competitive conditions and commercial problems, are beyond his skill and understanding. An attempt on his part to interfere in the conduct of such industries is certain to end in confusion. It is not possible that men of middle age, grown up in trade, or in the so-called learned professions, should be enabled by the mere grace of good intentions and election to office, wisely to advise in the conduct of such intricate industries as we are considering. Sit as members of a committee and hear reports they cannot intelligently criticise—yes; assent to the very simple and infrequent financing of a municipal undertaking—yes; but be of value in the actual conduct of such industries—no; find occupation in them for days in a week—no; unless in dogging the manager, embarrassing the administration and generally confusing counsels. There is nothing in all this to attract able and successful men. A man of the first class will not

knowingly put himself in such a position. He can find scope for his activities in a field with which he is familiar, or in which he can exercise his faculties without risk of disaster to his fellow citizens' interest, and his pride will not permit him to enter another.

There is evidence enough in the governing of American cities—and, indeed, in the governing of British cities—that the governing body is not performing with maximum efficiency the duties we all agree belong to it, and can be performed under our present system by it only. There is scope and trouble enough for the best in the policing and sanitation of our cities. Assume a governing body that can give each week six hours, or six days, to the acknowledged duties of an alderman. A certain measure of success is attained; nothing will be done too well. Now assume that each man goes into some private business that takes up half of the time otherwise devoted to his official duties; at once he gives less of his time to these duties, and if his services have ever been of continuing value their value is correspondingly reduced. It will be the same if the, to him, new business is the conduct of a municipal trading venture. The old and undeniably proper functions of a government will have less attention.

These statements are entirely consistent with what Professor Goodnow writes in his essay, "The British Municipality," with reference to the character of the committees which manage the various branches of the municipal undertakings. There is, as Professor Goodnow points out, a lure to municipal work in England that does not obtain in America. Membership in the municipal councils is one of the very few roads by which a man who has been prosperous in a commercial enterprise, can lift himself from a lower to a higher class socially; this possibility offers a temptation to his ambition; and many men will, under this temptation and urged thereto by members of their families, consent to undertake the management of a trading operation in a municipality. That the presence of men of high character in a municipal council does not prevent friction, quarreling and waste is shown by the experience of the Birmingham Gas and Electric committees. These committees are at sword's point—the Gas Committee having a stronger hold in the council than the Electric Committee, stifles the electric industry. This must be known to every member of the Committee of Twenty-one who visited Birmingham and talked with the councilmen. The discord in the Birmingham gas works, due to the antagonism between the secretary and the engineer—antagonisms which are injurious to the business, and which involved members of the council—is notorious. Thus we see, even when men of good class can be tempted by ambitions—which, fortunately, do not exist in this country—to undertake work with which they are not familiar, the result is deplorable.

The condition of affairs in the Gas Committee of the Birmingham council would not be permitted in any company. Its effect

is bad on the discipline of the entire force, and the condition of opposition that exists between the two committees—gas and electric—has been destructive of the electric industry in Birmingham. If, under the conditions that we know to exist in this council, under the necessity of being a party to the discords, of consenting to the partial suppression of a great industry, such men as are members of the Birmingham council are willing to serve, how much greater is the probability of being able to secure good men for such positions, if we leave to them all the attractions of governing positions and remove the things that cause irritation and humiliation!

Finally, the claim that the presence in municipal councils of many able men of high type, who would not otherwise be represented in the municipal governing bodies, is due to their sympathy with municipal trading, or desire to have a part in it, is disproven by the fact that many of the hardest workers and ablest men in municipal government are opposed to municipal trading and desire to terminate it. Among them we may quote Mr. Percy Harris, the leader of the conservatives in the London County Council, a lawyer who has given up his practice and devotes himself to the services of the community. Also, it did not appear that the city of Westminster, which does no municipal trading, was less ably and honorably served than the Borough of St. Pancras, which does municipal trading.

We have not found evidence in the United States that the personnel of the city government of Chicago or Wheeling is superior to that of Atlanta or Norfolk; or that the introduction of municipal water and electric plants in Detroit has brought a higher type of citizenship into the governing body than we find in New Haven, which has neither.

Aside from *ex parte* statements of avowed municipalizers, most of them members of the class they praise, the Committee found no evidence that adding trading to the duties of municipal officials has improved the character of the men seeking these offices.

CHAPTER II.

BRITISH GAS UNDERTAKINGS.

The reader of the following study of the results of our investigation of Gas Undertakings in Great Britain should bear in mind certain general facts.

The municipal gas plants investigated constitute the banner undertakings of the advocates of municipal ownership and operation. They have been cited as models, and their effects quoted extensively as examples for this country to emulate. Professor Goodnow, in his article on "The British Municipality," shows clearly how the social and political conditions in these British cities give them a character of government particularly favorable to the success of such undertakings.

Gas manufacture and supply is an old, established business; its general principles were worked out long ago and have been long

practiced. Compared with either the electric light, or the street railway business, it contains few elements of change, uncertainty and experiment. If we may prove municipal ownership and operation to be successful anywhere, it should be in these cities, with their ideal governments, and in this business, with its settled principles, and minimum of risks. We know not where to look with more hope of finding justification in practice for the claims of the advocates of municipalization than to the gas departments of these high class British municipalities.

I. SERVICE.

a.—Price to Consumer.

The price to the consumer may be presented in two ways, each correct from its own point of view, but giving different results.

Dividing the total receipts for gas from private consumers by the total quantity of gas sold to private consumers, will give the average amount per thousand cubic feet paid by private consumers. This, however, does not give a figure of cost that will be comparable between the different municipalities or companies investigated, because of the various practice in reference to meter rents, service pipe charges, etc. It is only by considering the price of gas, in connection with these charges, that we can determine which municipality or company, is giving the consumer gas at the lowest cost. In this comparison we leave out all reference to relative qualities of gas, and to relative convenience and efficiency of service.

Dividing the total receipts from sales of gas to private consumers by the total amount of gas sold them, we obtain:

Municipalities.

Birmingham	26.63d.
Glasgow	24.55d.
Manchester	28.54d.
Leicester	28.64d.

Companies.

London—So. Met.	23.85d.
Newcastle	20.82d.
Sheffield	17.81d.

It should be explained that in the case of Glasgow, the figure includes the gas sold for street lighting, as the schedule does not give the consumption of gas by private consumers separately.

It is evident that the companies' consumers pay less than the customers of the municipalities per 1,000 cubic feet of gas purchased.

To determine the cost of gas to the average householder, we must add the payments for gas, meter setting and rent, stove setting and rent—or purchase price—and divide the amount so obtained by the number of thousand cubic feet of gas used. We append a table giving the result of such calculation for each undertaking examined. The calculations are based on an estimated consumption of gas by two classes of consumers—one using 30,000

cubic feet, and the other using 20,000 cubic feet of gas per year. Where stoves are sold on the installment plan, or where charges are made for meter, or stove, fittings, we reasonably assume that such charges are spread over a period of five years. The table shows the cost of gas plus service per thousand feet, on each assumption, as worked out from the data obtained by the Committee.

COST TO A CONSUMER OF 1,000 CUBIC FEET OF GAS WITH ALL CHARGES, INCLUDING A GAS STOVE.

	On the Basis of an Annual Consumption of 30,000 cu. ft.		*On the Basis of an Annual Consumption of 20,000 cu. ft.*	
Municipalities.	*If through a Regular Meter.* Per M. in d.	*If through a Prepayment Meter.* Per M. in d.	*If through a Regular Meter.* Per M. in d.	*If through a Prepayment Meter.* Per M. in d.
Birmingham	36.1	{38.0 {34.0	39.8	{38.0 {34.0
Glasgow	29.0	29.0	31.0	29.0
Manchester	28.0	33.0	28.0	33.0
Leicester	34.4	33.3	37.7	33.3
Companies.				
London S. Met.....	29.2	33.0	31.8	33.0
Newcastle	25.4	34.5	27.3	34.5
Sheffield	21.9	....	23.9	....

At Birmingham the upper rate includes rental of stove.

In the case of London it would not be surprising to find that the inclusion of meter rents, stove rents and fittings, in view of the higher costs for labor and material in the metropolis, and the premiums and benefits to workmen, should so increase the costs as to make necessary a rate higher than in other towns. Yet in the former list it shows lower than any of the municipal plants, and in this table it shows lower than two of them on the plain meter basis, and lower than three of them on the prepayment meter basis.

This comparison shows that the consumers of the relatively small cities of Newcastle and Sheffield get cheaper gas than do consumers of the larger cities of Manchester, Birmingham or Glasgow. The difference in cost per ton of coal does not explain this difference in selling price of gas. The greater efficiency in management and in energy in selling residuals has much to do with the lower selling price of gas (see Financial chapter).

b.—Character of Supply.

Continuity of supply is the most important feature of a gas service. The relation of plant capacity to the maximum demand mainly determines the probabilities on this point. Apparently each plant, except Manchester's, has ample manufacturing capacity.

Manchester, with a maximum daily output of 26,819,000 cubic feet, has a daily capacity of 25,400,000 cubic feet. The continuity of supply in Manchester cannot be regarded as secure, or even reasonably safe. During one week of fog the supply of gas became so short that the pressure had to be reduced.

Second in importance is the uniformity and sufficiency of pressure at which gas is delivered to the consumer.

The answers to the schedule questions relative to pressures contain nothing to indicate that the pressures are not generally sufficient in any town, other than Birmingham and Manchester. Birmingham reports a pressure in some parts of its territory as low as six-tenths of an inch of water, and the pressure at the works is at times as low as 1 inch. However ample the mains may be, these pressures are insufficient. Manchester records having carried low pressures during a week of heavy fog; and considering the relation of its plant capacity to its maximum daily output, it is probable that there are other times when its pressures have to be cut below a satisfactory point.

In Newcastle and Sheffield the most careful and intelligent attention has been given to the maintenance of proper and uniform pressures. On the whole, the comparison on this point results favorably to the companies.

Third in the order of importance, as affecting the character of the service, is the uniformity and sufficiency of the candle power of the gas supplied. The candle powers as reported to the engineers, and given in their schedule, are as follows:

Municipalities—	*At Works.*	*Near Centre of Consumption.*
Birmingham	16.32	15.89
Glasgow	20.25	(Not reported)
Manchester	17.04	" "
Leicester	14.36	14.16
Companies—		
London—So. Met.		14.60
Newcastle		16.20
Sheffield		17.08

NOTE.—At the end of the year covered by this report Glasgow and Manchester each reduced its standard candle power by two candles. The official average at Glasgow for the following ten months is 18.17; at Manchester, for the following year, is 15.30.

In Schedule III, under question H-21, the experts set out in some detail, the methods, frequency and location of candle power tests in the various cities visited. It was not important to test the gas of the companies, for we have the record of tests by the official testers appointed by entirely independent authority. We are dependent on the statements of the department engineers for our record of illuminating value of gas sold by municipalities, because our experts did not make candle power determinations at any of the municipally-owned plants, except at Leicester, where one test was made by Mr. Klumpp, as below. He explains these facts as follows:

> "When going through the municipal works with the managers and superintendents, we expressed a desire to see the photometer rooms and make readings. We were put off in several instances, but after further request, we were, in some cases, allowed to enter the rooms, but we made no tests, and saw none made."

> "At Leicester, the photometer at the works was seen by me, but no readings were made for the above reason, but I persuaded Mr. Wm. Pingriff to show me the photometer in the basement of the office. I made one reading of the candle power, the gas burning through a Sugg D argand. Mr. Pingriff adjusted the flame to burn at the rate of about 5.9 cubic feet, and I made the reading under these conditions, and found it to be, after correcting the consumption to 5 cubic feet per hour, and correcting also for temperature and barometer, 13.4 candles. If the gas when tested had been burning, as prescribed in Parliamentary rules, at the rate of 5 cubic feet per hour, instead of 5.9 cubic feet, the result of the test would have been two candles lower, or 11.4 candles."

Mr. Walton Clark also made a point to ask, at each place visited, to see the photometer room. He did not succeed in getting into the photometer room of any municipality, but was at once admitted to the photometer rooms of the companies. He spoke of this to various members of the Committee.

It is impossible to believe that either Mr. Newbigging or Mr. Klumpp considered that they were making a complete investigation of gas plants and their operation, without determining the candle power of the gas delivered, or at least whether the methods adopted made the results comparable with the official tests of the gas supplied by the companies; and we gather from Mr. Klumpp's guarded remarks that they, to say the least, were not encouraged by the engineers of the municipalities to make candle power tests of their product.

Whatever the reason, whether neglect on the part of the experts to perform what every gas man knows is one of the necessary acts in connection with the investigation of the operation of a gas plant, or whether because they were denied the opportunity to perform such act, we have not from the experts, or from any independent authority, any information as to the candle power of the gas supplied by the municipalities.

We reason from the above that the operators of the municipal works preferred that no one, expert in gas photometry and connected with our Commission, should be admitted to their photometer rooms. We have to depend for our knowledge of the candle power of the gas supplied by the municipalities, upon the statements made to us by the engineers of the undertakings, and some outside, but authoritative, information, which serves to indicate the value of the tests of the municipalities for purposes of comparison.

We learn from the record that the gas of each of the companies is tested under Parliamentary rules, by an examiner appointed by an independent authority; whereas the gas of the municipalities is tested, if at all independently of the gas department, by men appointed by the City Council, or by a committee of the City Council, or by magistrates who may be, and in some cases are, members of the City Council—and in Glasgow, members of the Gas Committee.

The one municipality (Leicester) of whose methods we have knowledge, does not test according to Parliamentary rules.

For the Manchester municipal plant no tests of the gas are made by any official not connected with the gas department. There is no check on the department tests, which are made at the works. At one time a professor from one of the Manchester schools was engaged to test the gas, but he was discontinued after one year, for reasons not assigned. In this connection we have a statement from William King, Esq., J. P., M. I. C. E., from which the following is quoted:

> "1. In order to arrive at a useful comparison between the results of the gas undertakings in the neighboring cities of Liverpool and Manchester, it was necessary for him (Mr. King) to ascertain the quality of the Manchester gas when tested in the manner prescribed by Parliament for Liverpool gas. To this end a permanent testing place was established in the center of the city of Manchester and tests were made of the Manchester gas extending over a period of nine years. These tests were in every detail the same as those made on the Liverpool gas during the same period."

"ILLUMINATING POWER.

Manchester.

	Official Returns.	*Gas tested as in Liverpool.* (*Parliamentary Regulations.*)
Year.	*Average.*	*Average.*
1895.....	19.16	16.20
1896.....	19.55	16.49
1897.....	19.16	15.73
1898.....	19.51	17.34
1899.....	19.36	16.38
1900.....	19.40	15.86
1901.....	18.97	16.61
1902.....	18.54	14.50
1903.....	18.25	15.66"

Mr. King showed this record to Mr. Walton Clark and one other member of the Committee when they visited him at his hotel in London, and gave Mr. Clark a signed copy. It is not necessary to state to anyone familiar with the gas industry that Mr. King's character is of the highest, his reputation of the best, and that anything he says and any photometrical method he adopts will be accepted by the gas men of Great Britain. Mr. King is a high-class expert in gas matters and particularly in photometry work. He has been a member of a Royal Commission upon this subject. Mr. King's tests were made near the center of consumption, as the gas of all the companies was tested, and the result he obtained is comparable with the governmental reports of candle power at Sheffield and Newcastle. The Manchester municipality's recorded tests were made at the gas works. This difference of location may explain,

in large part, the difference in candle power. There is no intention here of questioning the bona fides of the operating engineer of Manchester's gas works. His honesty and ability are not in question. It is necessary to know, and on unquestioned authority, the candle power of Manchester's gas *as delivered to consumers*, and tested under proper and Parliamentary methods—as the candle power was tested in the neighboring cities of Liverpool, Sheffield and Newcastle. Mr. King's observations give us the information.

The official records for 1905 at Leicester municipal gas works give the average illuminating value as 14.36 candles. Our expert's test gave 13.4. In Leicester's so-called "illuminating book," in which the candle power records are kept, there is no record of the necessary observations or calculations, only the candle power claimed being recorded.

The gas tested is burned in an argand burner, at the rate of about 6 cubic feet per hour, and the candle power is corrected to a rate of 5 cubic feet. The effect of this is to make the illuminating value show high; the actual being approximately 14 per cent. smaller than the apparent. If the illuminating power had been determined with the gas burning at a rate of approximately 5 cubic feet per hour, the 14.36 candles reported as the average power for the year would have been 12.35. Had our expert's tests been made with the gas burning at the rate of approximately 5 cubic feet per hour, the result would have been 11.5 candles.

The engineer of the Leicester municipal plant, having told the Committee that the average candle power of the gas at the gas works during the year 1905 was 14.36 candles, said: "This gas at the consumers' burners will be about two candles lower." This appears a reasonable statement for at least a large part of the year. Correcting the 14.36 candles for error in method of testing, so that the results may be comparable with those obtained at the other plants investigated, reduces the candle power of the gas at the gas works to 12.35 candles—this being the actual candle power of the gas leaving the Leicester works if tested according to Parliamentary law. Reducing this by two candles, to allow for the loss which the engineer says takes place between the works and the consumer, we have the candle power of the gas delivered to the consumer, and tested according to Parliamentary law, 10.35 candles.

The accuracy of these deductions and conclusions will not be questioned by men expert in gas photometry; but in order that there may be no question as to the relation between the result of testing as Leicester tested, and the result obtained if the gas were tested according to Parliamentary regulations, a scientific test of the matter was made on similar gas at Philadelphia, under the observation of Dr. N. Wiley Thomas, gas inspector of the city of Philadelphia, and in the presence of Mr. Klumpp, one of the gas experts of the Commission. The Committee of Twenty-one were invited to witness these tests. Mr. Sullivan, Professor Goodnow, Mr. Edgar, Mr. Moffett and Mr. Walton Clark were present at the demonstration, which proved the accuracy of the above deductions and conclusions.

Since neither the experts nor the Committee were taken into the photometer rooms at Glasgow, we have no knowledge of the character of the photometers or of the work done, except as information was given by the gas department authorities.

We have then authoritative facts with reference to the candle power conditions existing in two of the municipally operated gas works in Great Britain. The conditions of the testing of the gas in each of the municipalities throws a doubt on the accuracy of the tests and statements, and what we find with reference to Leicester and Manchester compels the conclusion that no one of our Commission knows the candle power of the gas being sold by the municipalities investigated; with the certainty that it is not as high in the centers of consumption in Glasgow and Birmingham, as reported by their operating officials and recorded by our experts, as the candle power at the works.

The illuminating power of London gas is tested by the London County Council, and at points one to four miles from the works, according to methods and standards established by Parliament, and very favorable to the gas. Had it been tested under the same method as adopted by Mr. King in Manchester, it would probably have shown about two candle power lower, or about 12.6 candles.

In view of the above facts, we prepare a new table of candle power of gas at or near the center of consumption, and as tested under Parliamentary regulations, as follows:

Municipalities.	*Candle Power*
Birmingham	Unknown.
Glasgow	Unknown.
Manchester, 1905	14.0 approximate.
Manchester, 1906	12.0 "
Leicester	10.5 approximate.
Companies.	
London—So. Met.	12.6
Newcastle	16.2
Sheffield	17.8

If, in the above table we had reduced the reported candle power at Birmingham and Glasgow in the same proportion that our experience compels us to reduce the reported candle power in Manchester and Leicester, we would have had:

Birmingham	13 c. p.	approximate
Glasgow, year ending March 1, 1905	17 c. p.	"
Glasgow, for following ten months	15 c. p.	"

Accepting the above figures of candle power, we make a table to show what the consumer pays for his light.

Municipalities—	*Candle power of gas near center of consumption.*	*Price per M. as per table on page 314, col. 1.*	*Cost of 14 c. p. light for 1,000 hours.*
		d.	*s.* *d.*
Manchester	14.0	28.0	11 8
Leicester	12.5	34.4	16 0

Companies—	*Candle power of gas near center of consumption.*	*Price per M. as per table on page 314, col. 1.*	*Cost of 14 c. p. light for 1,000 hours.*
		d.	*s.* *d.*
London—So. Met.	12.6	29.2	13 6
Newcastle	16.2	25.4	9 2
Sheffield	17.08	21.9	7 6

NOTE.—Birmingham and Glasgow are here omitted because, as explained, we have no definite information of the candle power of their gas at centers of consumption. If we use the probably correct figures shown on page 319, the cost of a 14 c. p. light for 1,000 hours would be: Birmingham, 16s. 2d.; Glasgow, 9s. 11d.; Glasgow, for following ten months, 11s. 3d.

The figure here given for Leicester candle power is based on what the indicated candle power would have been if the gas had been tested by the system and method used in Newcastle and Sheffield, and is two candles higher than the probable candle power at the center of consumption, as stated by Leicester's engineer (see page 318). If we reduce Leicester's illuminating power, as this statement justifies, to 10.5 candles, we increase the cost of 1,000 hours of a 14 candle power light in Leicester to 19s. 1d.

The whole question of the quality of the product of the municipalities is in doubt. The members of the Commission who are familiar with gas and gas photometry see no escape from the conclusion that the above facts show that the service of the municipalities is not what it is claimed, that the municipalities are unwilling to have the actual quality of their service determined by independent and competent authorities, and that the gas supplied by private companies is much superior in candle power to that supplied by municipalities.

Leicester's engineer stated to the Committee that about 25 per cent. of the gas lights in use in Leicester were of the Welsbach type. Therefore, whatever the heating value, 75 per cent. of his lighting customers suffered from the poor illuminating quality of his gas. We do not know the proportion of this type of burner in use in the other cities visited.

The apparent indifference to illuminating value on the part of the municipalities is remarkable. Their failure to make the best reasonably possible gas for their consumers is consistent with their failure to give their consumers the facilities and attention that (as shown below) are afforded by the companies. We are not discussing questions of candle power versus price. It is no part of our duty to determine whether a company or municipality is wise to lower the illuminating value of its product, that it may sell at a lower price. We are comparing prices and qualities of the gas supplied by companies with prices and qualities of gas supplied by municipalities as we have found them.

Uniformity of candle power is important to the comfort of the consumer and to the utility of his gas consuming appliances. The authority for the information on this point as far as it relates

to municipal plants is the statement of the engineers. This information and the recorded official tests of the candle power of the gas supplied by the companies indicate satisfactory uniformity in the product.

The heating power of the gas was not determined by our experts. Reports were made to them by some of the municipalities and companies. These reports show a slightly higher heating value in the gas supplied by the municipalities. What we have demonstrated with reference to the candle power reports of the municipalities throws doubt on the data of the departments relating to heating values. We have no authoritative evidence on this point.

The statements with reference to the purity of the gas are subject to the same criticism as the statements with reference to candle powers; the municipalities report the quality of the gas they make, while the gas of the companies is examined by external authority. The reports indicate little difference; each company and municipality supplies commercially pure gas.

There remain to consider the convenience to the consumer, and the protection that the complaint department gives him against damage from leaks, or cessation, or shortage, of supply.

Answers to Question H-79 indicate a relative neglect on the part of the municipalities to afford convenience for complaining consumers. At Birmingham there is one central office in the city, one at Sutton and one at Wednesbury. Sutton and Wednesbury are relatively small settlements, three or four miles from the city limits; so Birmingham itself has but one office for a population of 560,000.

Glasgow, Manchester and Leicester have each but one office, Glasgow supplying a population of 1,000,000, Manchester 750,000, and Leicester 250,000. Not enough for the convenience of the public, except in the case of Leicester.

A claim that in certain towns the repair shops or plumbers' shops of the undertaking are available for the receipt of complaints and orders, does not meet this criticism. A shop is a complaint office only in the sense that every post box is a complaint office; it is a place at which the consumer desiring work done may deposit his order. A "complaint office" is a place at which a consumer may discuss with some one familiar with the business, the conditions surrounding his use of gas; may learn of new or improved methods of utilizing gas, either for old purposes or new, and may receive advice and information. Provision for the receipt of orders at shops in no sense makes these shops proper complaint offices.

London has offices scattered through the district; the number is not given. Newcastle has two offices, for a population of about 360,000; Sheffield has but one office, for a population of 470,000.

It would seem to an American that not any of these cities, except London, Newcastle and Leicester, is sufficiently supplied with points at which complaints and orders could be entered. The municipalities are not as well equipped as the companies.

The complaint and order situation can be best described by quoting the summary prepared by the experts themselves in their supplementary report:

> "One of the subjects examined by us in considerable detail was the system of handling consumers' complaints in use by the various undertakings. The methods employed by both the municipal and private undertakings were good, but the private companies in all cases were somewhat better equipped and were more systematic in checking up quickly the nature of the complaint and seeing that it was quickly attended to, paying particular attention to the wants of the consumer."

II. USE.

a.—Extent of Use.

In comparing the extent to which gas is used in the British cities examined, the first inquiry relates to the volume of gas sold per capita. The figures are:

Municipalities—	*Population of Area Supplied.*	*Sales per M. C. F. to Consumers and Public Lighting.*	*Sales per Capita.*
Birmingham	800,000	6,192,354	7,740
Glasgow	1,000,000	5,821,471	5,821
Manchester	750,000	4,780,510	6,374
Leicester	250,000	1,834,866	7,339
Companies			
London, So. Met.....	1,500,000	12,142,723	8,095
Newcastle	520,000	2,887,804	5,553
Sheffield	470,000	2,796,897	5,951

Taking an average of these figures, we find the sales per capita in the four cities where the plant is operated by the municipality to be 6,683 cubic feet, while in the three cities where companies operate, the sales per capita is 7,155 cubic feet.

It may be objected that London being a metropolitan district is not strictly comparable with the other cities. In a sense this is true, but so far as population and metropolitan conditions go, it may be said that cities like Glasgow, Birmingham and Manchester exceed towns like Newcastle and Sheffield to fully as great an extent as they themselves are exceeded by the South Metropolitan district of London, which is the poorer section and does not contain the brilliantly lighted and extravagant centers of the metropolis. We see no reason why a comparison of the sales per capita between the two groups is unfair to the municipalities.

It may fairly be said that our investigation shows that under private management in England the quantities of gas sold per head of population were greater than under public management, as would naturally follow from the lower prices and better service.

Let us look at this question of sales per capita in another way; let us eliminate from the comparison those cities where special conditions may be claimed to exist, and attempt to compare only those of the same general character. We will thus omit London, Leicester and Birmingham. London, because of its size and because the conditions of life are so different that it may be claimed, as mentioned above, that no comparison can be profitably drawn between it and any of the other towns.

Leicester we will omit because it differs from any other British city investigated, in that it is a town of small manufactures with practically no slums and little squalid poverty. The people who work in Leicester live in the city, and there are no suburbs of moment. Large estates come on all sides up to the border of the city; except that there are, outside and near the town, a few groups of buildings surrounding mills, in which the residents of these little villages find employment. They are in no sense a part of the population of Leicester and contribute very little to it, but they are reached by the gas mains of the Liecester corporation and are included in our statement of the population.

We will omit Birmingham because of the peculiar character of its consumers. At Birmingham the sales per meter are 34 per cent. larger than the sales in London, and 64 per cent. larger than in the town having the next largest sales per meter, which is Newcastle. Its sales per capita are larger than in any other town except London. Large sales per meter argue many large consumers. The competition of the electric light with gas in Birmingham is slight, the electric sales being only 8½ kilowatt hours per capita per year. No effort is made to take business away from the gas undertaking. The chairman of the Electric Committee said that, having laid some electric mains into a district not previously supplied by electricity, he started to circularize the district in the interest of electric lighting sales. The chairman of the Gas Committee objected, "and," said the chairman of the Electric Committee, "the influence of his committee in council was greater than the influence of my committee, and I was compelled to stop advertising electric current." These facts explain the large sales per meter and per capita in Birmingham.

Thus, we have left the two municipal plants of Manchester and Glasgow to compare with the private plants of Newcastle and Sheffield. The sales per capita average in the two municipal cities 6,058 cubic feet, and in the two company cities 5,742 cubic feet. The sales per meter (or consumer) are 27,000 cubic feet and 34,700 cubic feet respectively. The sales per mile of main are 6,030 cubic feet, and 4,790 cubic feet, respectively. The number of persons in the area supplied per mile of main is 995 and 834 respectively. The number of persons per meter in use is 4.5 and 6.0 respectively.

The sales per capita in Newcastle and Sheffield are larger than we would expect, from a study of the figures for Glasgow and Manchester. Newcastle and Sheffield being smaller cities, it is surprising to find the sales per capita of these companies are almost as

large as those in Glasgow and Manchester. The Newcastle Gas Company is competing against active electric light companies. This town is nearly of the same character as Glasgow and Manchester, which have little electric competition.

We must conclude, from the relatively large gas sales per capita, that the greater activity in advertising, the better service and lower price are bringing to the companies the reward due intelligent effort, and to the cities in which they operate, social good of an extended service.

The small sales per mile of main in Newcastle and Sheffield as compared with the other cities, combined with the large sales per capita, indicate the effort that these companies have had to make in order to increase the consumption. It is evident that they have advanced the general good by extending the mains into territory of a class that the municipalities regard as unprofitable.

The number of gas stoves rented in Sheffield is 4,973—a very small number if it represents all the stoves in use. It does not, however, for Sheffield discourages rental and encourages purchase. The sales per capita in Sheffield indicate that almost every domestic consumer must use a gas stove, because, being a city largely of working people and the business being conducted in active competition with an electric lighting plant, the sales per capita would, if the gas were used only for illuminating, be very small.

In comparing the opportunities afforded and the inducements given to the citizens of a town to use gas, another important consideration is the relative proportion of the citizens reached by the mains of the municipality or company. With the exception of London and to a less degree Leicester, each of the cities visited had an opportunity to extend its mains into a more or less sparsely settled territory. The area supplied by the South Metropolitan company of London is entirely surrounded by populated areas supplied by other companies. It, therefore, has no opportunity to reach out into a sparsely settled territory. Considering the remaining five plants, the population per mile of main is as follows:

Municipalities.	
Birmingham	1,081
Glasgow	1,111
Manchester	874
Companies.	
Newcastle	803
Sheffield	872

This table shows that, other things being taken as equal, Newcastle and Sheffield have in their efforts to secure business, extended the opportunity to use gas to a larger proportion of the population of the area supplied than has any of the municipal undertakings. These two companies have given slightly more opportunity to the citizens of the towns to become gas consumers than Manchester, and very much more opportunity than Glasgow or Birmingham.

The valuation placed by the experts on the distributing systems of the plants shows that the companies in their efforts to get business, have expended in proportion to their population 25 per cent. more on their distributing systems than have the municipalities.

We must conclude from these facts that the companies are exhibiting more enterprise, a more adventurous spirit than the municipalities, and that the general good of the communities they serve has been correspondingly advanced.

b.—Character of Users.

A comparative study of the character of users of gas in the two classes of cities will involve (1) the use of gas for cooking purposes, (2) its use for heating purposes, (3) its use for industrial purposes, (4) its use for show window and store illumination, (5) its use for power, (6) its use by the poorer classes as stimulated by the prepayment meter or other means, and (7) its use for public or street illumination.

(1) The experts could obtain little knowledge of the number of cooking stoves in use in the cities investigated, beyond the number rented and sold on the installment plan. As each of these cities except Sheffield maintained systems of renting, selling and connecting cooking stoves that are of a very similar character, it is not unfair to compare the figures showing the number of stoves rented in an endeavor to learn which of the two classes of cities has better succeeded in spreading this beneficent means of utilizing gas. The figures are:

	Number of Cooking Stoves Rented and Sold on Installment Plan.	*Number of Meters (Consumers) per Cooking Stove Rented and Sold on Installment Plan.*
Municipalities—		
Birmingham	30,848	3.5
Glasgow	29,347	8.1
Manchester	23,862	6.3
Leicester	43,283	1.2
Companies—		
London, So. Met.....	231,807	1.2
Newcastle	43,256	1.9
Sheffield	4,973	16.4

In comparing these figures, Sheffield for obvious reasons must be omitted. In that city the management has always discouraged the placing of stoves on rental and has not utilized the prepayment meter in the manner done in all the other cities for the purpose of inducing consumers to use cooking stoves. Another method, that of an extremely low flat-rate price for the gas, with easy terms of sale and connection of the stoves, has been used and has obtained the business.

Comparing the two private plants with the four municipal plants, it is evident at a glance that the former have the better of the comparison. Such a result might have been foretold after a consideration of the relative activities of the two classes of management in the matters of canvassing and maintenance of show rooms.

On this point Glasgow furnishes an excellent example of the sluggishness of a municipal management in the adoption of new ideas. Years after the use of the prepayment meter as a factor in the introduction of the gas cooking stove was generally adopted in British gas plants, this bright star in the firmament of the advocates of municipal ownership held back, having fallen into line only within the last three years. It may be claimed that in Glasgow a greater proportion of the consumers own stoves, but the absence of canvassing and show rooms combined with the price of gas as compared with Sheffield, throws grave doubts around the assumption.

(2) The schedules contain little that is definite on the use of gas for heating purposes. Leicester is recorded as having 3,000 heaters rented, London, 20,500, and Newcastle, 459. In the absence of definite figures as to the relative numbers of heating stoves in use or as to the quantities of gas used for this purpose, it is reasonably safe to assume that they are in proportion to the amount of canvassing done. This is a class of gas consumption which depends largely on canvassing for results.

(3) The use of gas by manufacturers for such purposes as hardening, brazing, annealing, melting, etc., is almost entirely a function of the extent to which such business is canvassed. One would expect to see the greatest development in manufacturing cities like Birmingham and Manchester, and the large consumption per meter in the former case would indicate that these conditions existed there. On this basis, Glasgow makes a poor showing.

(4) In a sense the illumination of stores and show windows may be said to belong to the electric light. The advent of the incandescent gas lamp (upright and inverted) has enabled gas to invade this field to some extent. This is, however, emphatically a business which must be sought to be obtained. It is reasonable to suppose that the companies which do active canvassing have been more successful in this field than the municipalities which do little or none. In considering this question, the active electric competition in Newcastle and Sheffield should be compared with the throttling of the electric plants by the gas department in some of the municipalized towns.

(5) Among the cities investigated, only Glasgow, Manchester and Leicester make a lower price for gas used for power purposes, and from this it might be supposed that these cities have been the most successful in working up a power business. But it is noted that the special power prices in Glasgow and Manchester are, when the discounts are included, still higher than the regular prices in London, Newcastle and Sheffield, so that if

this question of price may be used as an argument either way it stands in favor of the companies. The schedules contain the actual quantities of gas sold for power purposes in only four cities, these being probably estimated figures in those places where there is not a separate power rate. These figures show that Birmingham sells for power purposes 15 per cent. of its total sales; Manchester, 8 per cent.; Leicester, 13 per cent.; Sheffield company, 8 per cent. As there is only one company here to compare, any conclusion must be imperfect, but when we take into consideration what we know of the character of Sheffield with its manufacturing industries on a large scale, with what we know of the other cities with their numerous small, diversified industries, there is every reason to praise the showing made by Sheffield. Certainly, comparing Manchester and Sheffield, in the light of the kinds of industries that flourish in these two cities, the company may be said to have beaten the municipality badly in the competition for gas engine business.

(6) In England one of the principal functions of the prepayment meter is its use as an inducement to the poorer classes to use gas. A glance at the figures contained in the schedules shows that in the relative numbers of this type of meter in use, the companies have made better progress than have the municipalities. Sheffield is not included in the above statement, for reasons already explained, but its very low price enables it to accomplish much the same result. The conditions at Glasgow seem somewhat anomalus in that, while they have been notoriously slow in the adoption of the prepayment meter and have proportionately only a trivial number in use, yet a relatively large percentage of the population supplied are gas consumers. This cannot be accounted for by a low price, which does not exist, nor by intelligent efforts to extend use, for none are made.

Glasgow on the surface appears a good gas city in spite of high price and poor management of sales department. Failing to push the business of the electric department of the city has had a beneficial effect on gas sales, while stifling the electric industry.

Birmingham is behindhand, with a low percentage of its population as gas consumers.

On the whole, in consideration of the more general use of the prepayment meter, of the lower prices prevailing for gas and the canvassing employed, the conclusion is inevitable that the use of gas by the poorer classes in the towns having privately operated works is more general than in those whose works are operated by the municipality.

(7) The extent to which the municipality has availed itself of the use of gas for street illumination is a question which does not depend primarily on the energy or efficiency displayed in the conduct of the gas business, and hence will not be discussed here. We will confine ourselves to an inquiry as to the terms offered to the municipalities in the two classes of cases. An inspection of the prices charged for the gas used in the street lamps shows that with

the exception of Birmingham, the two company towns of Newcastle and Sheffield charge lower prices than the departments of the municipalities, with the added advantage that in Newcastle the company supplies at its own cost all the new equipment. In London the gas is not sold as such but is included in a contract for Kern lamps for which a rental is paid by the city.

Summing up the inquiry as to the "Character of Users," it may be safely said that our investigation has shown that, in those British cities where the gas business is conducted by private enterprise, gas is used for more diversified purposes, or maintains a greater variety of "Users" than in those cities where the municipality is in charge.

c.—Efforts to Extend.

We now consider the relative efforts of the municipalities and companies to induce the inhabitants to use gas. This effort may be made through advertising, canvassing or attractive show rooms in central locations. The result is in some degree a measure of the social good the undertakings are accomplishing.

We find that the Birmingham, Glasgow and Manchester gas departments do no canvassing. Leicester has three canvassers. Each of the companies has canvassers and a new business department devoting their energies to the extension of the use of gas.

Show rooms conveniently located and efficiently arranged and attended are important factors in the effort to extend the use of gas. At Birmingham the basement of the gas office is devoted to a display, where a small but comprehensive and neatly arranged outfit of appliances is kept. This is the one show room for the Birmingham gas department, supplying a population of 800,000 people.

Glasgow has three show rooms. The Committee visited the central and largest of these rooms. It is here that stoves are shown and instruction given for the use of gas in cooking and other appliances. This show room was insignificant in size and equipment, in proportion to the importance and size of the city of Glasgow. There are in America cities of less than 50,000 population with better gas show rooms.

Manchester makes practically no effort at a display of gas appliances. There is a show room on Deansgate, fair, but small and incomplete for a city of this size.

Leicester has a display room near the center of the city with a small, but good, display of gas and electrical appliances.

The South Metropolitan company, London, devotes the first floor of its main office to a display room, and maintains offices scattered throughout its territory for the purposes of display and demonstration. The main display room is superior to any operated by any one of the municipalities.

The Newcastle company has a display room with a large line of appliances.

The Sheffield company has a large, handsome display room on the first floor of its office, containing a complete outfit of stoves and appliances.

The almost universal practice of companies having an article for sale is to advertise in the newspapers or through circulars. Glasgow does very little advertising and the other municipalities not any. Each of the companies advertises extensively, using the newspapers, circulars and postal cards.

The Newcastle company has twice given exhibitions, running several weeks, to which the inhabitants of the city are invited, that they may be made acquainted with the various uses to which gas may be applied and the economical methods of application. Experienced women are sent to the houses of Newcastle consumers to instruct them in the use of cooking stoves.

The Sheffield company periodically gives a series of lectures and demonstrations of the use of gas for cooking.

Messrs. Newbigging and Klumpp, in their supplemental report, close their consideration of the subject as follows:

> "Summarizing the foregoing, the conclusion arrived at is that whilst gas appliances of every kind may be obtained from either the municipalities or the companies, the latter show greater enterprise in pushing their use amongst gas consumers."

Among the means of inducing the poorer portion of the population to use gas is the offer of an opportunity to pay for the gas as it is used and therefore to avoid the possibility of receiving a bill for an unexpectedly large amount. This is accomplished by the prepayment meter. In some degree we may measure the benefit of a system to the poorer people of the community by the percentage of prepayment meters in use. Four and three-tenths per cent. of Glasgow's consumers use prepayment meters; 64.9 per cent. of the South Metropolitan company's (London) consumers use prepayment meters. Sheffield's method of getting down to the lowest flat rate possible is worthy of notice. The Sheffield company's rate (18d.) is so low that in itself it constitutes a means of inducing all classes to consume gas, and rivals in its results those of the prepayment meter.

Among the efforts to extend the use of gas may be classed any reduction made in the selling prices. The investigation has revealed the following favorable showing for the privately operated plants:

The price of gas has been reduced in Birmingham (municipal) between 1900 and 1906 3d. per thousand cubic feet for ordinary consumers.

The price in Glasgow (municipal) has been reduced 1d. per thousand cubic feet since 1900. It was advanced for the years 1901 and 1902 4d. per thousand cubic feet, and the average price to the consumer during the past three years has been as high as it was in 1900.

This is also true of Manchester (municipal), where the price, having been 2s. 3d. in 1900, was advanced to 2s. 6d. in 1901, to 2s. 9d. in 1902 and 1903, to 2s. 6d. in 1904, and to 2s. 4d. in 1905. The price is now 1d. higher than it was in 1900.

At Leicester (municipal) the price has been reduced 2d. per thousand cubic feet since 1900.

In London (company) the price has been reduced 3d. with no increase at any time.

In Newcastle (company) the price has been reduced 3d. with no increase at any time.

In Sheffield (company) the price has been reduced 8d. since 1901, the earliest date of which we have record, with no increase at any time.

Schedule IV., question I 13, gives a reduction in price at Birmingham in 1875-6 coincident with the change from private to municipal operation, averaging 3d. per thousand cubic feet, or 9 per cent. That this reduction was not unusual, nor to be credited to the change in method, is shown by the fact that in the same years over 200 gas plants in Great Britain made reductions ranging in the larger towns from five to thirty per cent. In the United States, while the record is incomplete, over 100 cases of reductions, ranging from eight to thirty-seven and one-half per cent. are known. These latter facts are derived from announcements in public print.

We must conclude from our record that the companies investigated are tending to lower rates more rapidly than are the municipalities.

III. COST OF PRODUCTION.

The following figures are taken from the report of the experts:

Municipalities—	*Mfg. Costs per M. in d.*	*Distrb'n Costs per M. in d.*	*General Costs per M. in d.*	*Total Cost per M. in d.*
Birmingham	22.30	2.54	0.57	25.41
Glasgow	21.37	2.98	0.94	25.29
Manchester	17.92	5.03	1.25	24.20
Leicester	17.42	3.58	0.97	21.97
Companies—				
London—So. Met.	19.90	3.67	2.47	26.04
Newcastle	16.72	2.35	1.58	20.65
Sheffield	15.56	2.29	1.26	19.11

NOTE.—In the above figures, credits for residuals have not been deducted.

For obvious reasons London costs are high. The higher prices prevailing in the south of England generally, and particularly within the metropolitan area, for both labor and material easily account for the high costs per thousand in operating expenses. Attention is called also to the large amounts paid in London for damages, injuries and claims. These two items materially swell London's total costs, and show the effect of crowded streets and other metropolitan conditions, and of a liberal policy toward injured employees and citizens. The item of copartnership charges also bulks large in the London account, but the generous copartnership scheme maintained by that company more than justifies this item of expense.

Omitting London, as we must to make the comparison mean anything, but little comment is needed on these figures. The

showing made by the two companies in comparison with the municipal plants is good. It is interesting to note that the companies average a considerably larger amount paid in salaries to officers and to canvassers, etc., and to observe how well this liberal policy is repaid in a lower total cost of product and wider extent of use.

In the cost figures listed above, the returns from residuals are not taken into account, and as these figures have a very material bearing on the profits, it is instructive to consider them here.

The returns from the sale of coke, tar, ammoniacal liquor and other residuals and by-products, are:

Municipalities—	*Residuals per M. in d.*
Birmingham	7.58
Glasgow	7.58
Manchester	5.79
Leicester	7.73
Leicester—	
London—So. Met.	9.43
Newcastle	7.88
Sheffield	10.11

The companies have exhibited greater energy and intelligence in preparing their residuals for market, and in pushing their sale.

The Glasgow department has helped its residual sales by somewhat illogically leasing its residual plants to a private company for operation.

IV. PLANT.

a.—Character.

The word "plant" in this connection is used to cover all the real estate, buildings, pipes, wagons, teams, tools, generating, purifying, storing, distributing and measuring apparatus used in the handling of materials, the manufacture, measurement and distribution of gas, and the handling and utilization of residuals, whether sold in the raw state or converted into other useful products before sale. No material thing that has to do with the physical operation of the gas works, beginning with the removal of the raw material from the boat or car, and ending with the measurement of gas at the consumer's meter, should be excluded from consideration when discussing a gas plant.

The ideal gas plant will have at the works sufficient capacity for the storage of raw materials of manufacture to give it a reasonable assurance against shortage during strikes, lockouts or other causes tending to prevent the delivery of materials by contractors. It will have sufficient generating, purifying and holder capacity to enable the management to supply to consumers at all times as much gas as they desire to take, with such proper proportion of generating and purifying capacity to holder capacity as will enable the works to be run uniformly any twenty-four hours. Where the use of labor-saving machinery will lead to a reduced cost of gas or, other things being equal, will tend to reduce the necessity of hard and debasing labor, it should be introduced. The

plant should be so equipped with the necessary tanks, pumps, etc., that all residuals may be saved for utilization or sale. The works should be kept clean and made as attractive as reasonably possible. They should be rendered as safe as possible for the workmen and the casual visitor, and the fire risk to buildings of the plant, or on adjacent property; eliminated as far as practicable. The mains, services and consumers' meters should be of such size as to enable all consumers to obtain gas to meet their maximum requirement at any time, and of such size as to maintain throughout the distribution system a pressure of gas suitable to all the purposes for which gas may be required and with the least practicable variation.

In general it is very difficult to compare the gas plants of the municipalities and those of the private companies, as there are many manufacturing stations in each case. The conditions under which the works have been built are not all known to us, and practically all that we can say, after reading the reports of the engineers, is that, in new work, the private companies are more alive to the necessity of saving money in construction and arranging to save money in operation.

Each plant examined had sufficient storage room for the necessary quantities of raw materials of manufacture. Each plant, except Manchester, had sufficient generating, purifying and holder capacity.

One of the works at Birmingham, the Adderly street; one of the works at Leicester, Belgrave Gate; one of the works at Newcastle, the Elswick; one of the works at Sheffield, the Effingham street; are old plants, with some hand charging, and some direct fire, benches. The one large, fine, modern plant, built for efficient and economical operation, is the East Greenwich plant at London. Leicester had, undoubtedly, the cleanest and, to the eye of the layman, the most attractive plant. There was, however, from the engineer's point of view, little to say in commendation of it.

The municipalities have shown extravagance and poor judgment in the selection and development of their gas work sites generally. This is evidenced by the acreage occupied by the coal gas plants per thousand cubic feet of daily manufacturing capacity. Provan, Glasgow, for instance, covers a site of 120 acres, with a present manufacturing capacity of 12,000,000 cubic feet daily, or 10 acres per million; it has a future capacity of 48,000,000, which would give it an acreage of 2.50 per million; but the layout of the plant is such that the unoccupied property must lie idle until occupied by the extensions in view. Practically the entire property has been improved by the completion of roadways, boundary walls, bridges and railway sidings, making the present investment exceedingly heavy per thousand cubic feet of capacity.

Birmingham has a property of 114 acres at Birches Green, somewhat east of the city, purchased a few years ago, apparently unwisely, as there has been strong opposition to any gas works extension in that neighborhood. Now the property is offered for sale. The Swan village plant occupies property several miles away

from the area it supplies, and must be considered very poorly located for a gas manufacturing plant.

The Aylestone works at Leicester is an evidence of the extravagant use of land by a municipal undertaking. With 9,000,000 cubic feet daily capacity spread over forty acres, or 4.4 acres per million, it stands in great contrast with the private plants investigated. While this site might have been developed to supply at least double this quantity of gas, the city has purchased an additional site of 150 acres in a beautiful farming country north of the city, which will probably remain idle for years.

The Grimesthorpe works of the Sheffield company allows of development without waste or extravagance. Extension can be made to the present plant with the least possible expense and greatest efficiency.

The East Greenwich works of the South Metropolitan Gas Company, London, occupies a site of 120 acres, the works on which can be extended unit by unit as required, while the undeveloped property can be, and is, utilized for other purposes rendering an income on the investment. The 120 acres will ultimately have a capacity of 75,000,000, or 1.60 acres per million, against Provan's (Glasgow) 2.50 acres per million. The purchase of this large property was a wise investment, because several of the South Metropolitan company's more central works will have to be abandoned in the near future, due to the rapid growth of the great city. The method by which the company is utilizing this property can be contrasted with the method by which the Glasgow corporation is utilizing the Provan property. It illustrates the conservatism with which this great company makes its investments. The other London plants are manufacturing with an economy of space, or land occupied, that is not approached by any of the municipal undertakings investigated.

The Newcastle company's plants have practically reached the limit of their capacity and provision has been made for the development of the St. Anthony's property at the eastern end of the city, where a large storage holder has been erected. The plans for the new works are finished and have been approved by some of the best consulting engineers of the country.

One point that may be particularly noted is the large investment of the municipal undertakings in preparing the sites for their works—the enormous amounts spent on boundary walls, on roads and bridges and on elaborate, and in many cases unnecessary, railway sidings and trestles. This is particularly noticeable at Provan, Glasgow; Aylestone, Leicester; Windsor street, Birmingham; Nechels, Birmingham; and Tradestone, Glasgow.

The introduction of modern apparatus has been fairly general in all of the undertakings examined, but the companies have shown more initiative in seeking every appliance that would tend to reduce operating costs. London's experiments of installing benches of twenty to a setting, of placing their station meters underground without housing, of adopting outside producers at Old

large as those in Glasgow and Manchester. The Newcastle Gas Company is competing against active electric light companies. This town is nearly of the same character as Glasgow and Manchester, which have little electric competition.

We must conclude, from the relatively large gas sales per capita, that the greater activity in advertising, the better service and lower price are bringing to the companies the reward due intelligent effort, and to the cities in which they operate, social good of an extended service.

The small sales per mile of main in Newcastle and Sheffield as compared with the other cities, combined with the large sales per capita, indicate the effort that these companies have had to make in order to increase the consumption. It is evident that they have advanced the general good by extending the mains into territory of a class that the municipalities regard as unprofitable.

The number of gas stoves rented in Sheffield is 4,973—a very small number if it represents all the stoves in use. It does not, however, for Sheffield discourages rental and encourages purchase. The sales per capita in Sheffield indicate that almost every domestic consumer must use a gas stove, because, being a city largely of working people and the business being conducted in active competition with an electric lighting plant, the sales per capita would, if the gas were used only for illuminating, be very small.

In comparing the opportunities afforded and the inducements given to the citizens of a town to use gas, another important consideration is the relative proportion of the citizens reached by the mains of the municipality or company. With the exception of London and to a less degree Leicester, each of the cities visited had an opportunity to extend its mains into a more or less sparsely settled territory. The area supplied by the South Metropolitan company of London is entirely surrounded by populated areas supplied by other companies. It, therefore, has no opportunity to reach out into a sparsely settled territory. Considering the remaining five plants, the population per mile of main is as follows:

Municipalities.	
Birmingham	1,081
Glasgow	1,111
Manchester	874
Companies.	
Newcastle	803
Sheffield	872

This table shows that, other things being taken as equal, Newcastle and Sheffield have in their efforts to secure business, extended the opportunity to use gas to a larger proportion of the population of the area supplied than has any of the municipal undertakings. These two companies have given slightly more opportunity to the citizens of the towns to become gas consumers than Manchester, and very much more opportunity than Glasgow or Birmingham.

The valuation placed by the experts on the distributing systems of the plants shows that the companies in their efforts to get business, have expended in proportion to their population 25 per cent. more on their distributing systems than have the municipalities.

We must conclude from these facts that the companies are exhibiting more enterprise, a more adventurous spirit than the municipalities, and that the general good of the communities they serve has been correspondingly advanced.

b.—Character of Users.

A comparative study of the character of users of gas in the two classes of cities will involve (1) the use of gas for cooking purposes, (2) its use for heating purposes, (3) its use for industrial purposes, (4) its use for show window and store illumination, (5) its use for power, (6) its use by the poorer classes as stimulated by the prepayment meter or other means, and (7) its use for public or street illumination.

(1) The experts could obtain little knowledge of the number of cooking stoves in use in the cities investigated, beyond the number rented and sold on the installment plan. As each of these cities except Sheffield maintained systems of renting, selling and connecting cooking stoves that are of a very similar character, it is not unfair to compare the figures showing the number of stoves rented in an endeavor to learn which of the two classes of cities has better succeeded in spreading this beneficent means of utilizing gas. The figures are:

Municipalities—	*Number of Cooking Stoves Rented and Sold on Installment Plan.*	*Number of Meters (Consumers) per Cooking Stove Rented and Sold on Installment Plan.*
Birmingham	30,848	3.5
Glasgow	29,347	8.1
Manchester	23,862	6.3
Leicester	43,283	1.2
Companies—		
London, So. Met.....	231,807	1.2
Newcastle	43,256	1.9
Sheffield	4,973	16.4

In comparing these figures, Sheffield for obvious reasons must be omitted. In that city the management has always discouraged the placing of stoves on rental and has not utilized the prepayment meter in the manner done in all the other cities for the purpose of inducing consumers to use cooking stoves. Another method, that of an extremely low flat-rate price for the gas, with easy terms of sale and connection of the stoves, has been used and has obtained the business.

Comparing the two private plants with the four municipal plants, it is evident at a glance that the former have the better of the comparison. Such a result might have been foretold after a consideration of the relative activities of the two classes of management in the matters of canvassing and maintenance of show rooms.

On this point Glasgow furnishes an excellent example of the sluggishness of a municipal management in the adoption of new ideas. Years after the use of the prepayment meter as a factor in the introduction of the gas cooking stove was generally adopted in British gas plants, this bright star in the firmament of the advocates of municipal ownership held back, having fallen into line only within the last three years. It may be claimed that in Glasgow a greater proportion of the consumers own stoves, but the absence of canvassing and show rooms combined with the price of gas as compared with Sheffield, throws grave doubts around the assumption.

(2) The schedules contain little that is definite on the use of gas for heating purposes. Leicester is recorded as having 3,000 heaters rented, London, 20,500, and Newcastle, 459. In the absence of definite figures as to the relative numbers of heating stoves in use or as to the quantities of gas used for this purpose, it is reasonably safe to assume that thev are in proportion to the amount of canvassing done. This is a class of gas consumption which depends largely on canvassing for results.

(3) The use of gas by manufacturers for such purposes as hardening, brazing, annealing, melting, etc., is almost entirely a function of the extent to which such business is canvassed. One would expect to see the greatest development in manufacturing cities like Birmingham and Manchester, and the large consumption per meter in the former case would indicate that these conditions existed there. On this basis, Glasgow makes a poor showing.

(4) In a sense the illumination of stores and show windows may be said to belong to the electric light. The advent of the incandescent gas lamp (upright and inverted) has enabled gas to invade this field to some extent. This is, however, emphatically a business which must be sought to be obtained. It is reasonable to suppose that the companies which do active canvassing have been more successful in this field than the municipalities which do little or none. In considering this question, the active electric competition in Newcastle and Sheffield should be compared with the throttling of the electric plants by the gas department in some of the municipalized towns.

(5) Among the cities investigated, only Glasgow, Manchester and Leicester make a lower price for gas used for power purposes, and from this it might be supposed that these cities have been the most successful in working up a power business. But it is noted that the special power prices in Glasgow and Manchester are, when the discounts are included, still higher than the regular prices in London, Newcastle and Sheffield, so that if

this question of price may be used as an argument either way it stands in favor of the companies. The schedules contain the actual quantities of gas sold for power purposes in only four cities, these being probably estimated figures in those places where there is not a separate power rate. These figures show that Birmingham sells for power purposes 15 per cent. of its total sales; Manchester, 8 per cent.; Leicester, 13 per cent.; Sheffield company, 8 per cent. As there is only one company here to compare, any conclusion must be imperfect, but when we take into consideration what we know of the character of Sheffield with its manufacturing industries on a large scale, with what we know of the other cities with their numerous small, diversified industries, there is every reason to praise the showing made by Sheffield. Certainly, comparing Manchester and Sheffield, in the light of the kinds of industries that flourish in these two cities, the company may be said to have beaten the municipality badly in the competition for gas engine business.

(6) In England one of the principal functions of the prepayment meter is its use as an inducement to the poorer classes to use gas. A glance at the figures contained in the schedules shows that in the relative numbers of this type of meter in use, the companies have made better progress than have the municipalities. Sheffield is not included in the above statement, for reasons already explained, but its very low price enables it to accomplish much the same result. The conditions at Glasgow seem somewhat anomalus in that, while they have been notoriously slow in the adoption of the prepayment meter and have proportionately only a trivial number in use, yet a relatively large percentage of the population supplied are gas consumers. This cannot be accounted for by a low price, which does not exist, nor by intelligent efforts to extend use, for none are made.

Glasgow on the surface appears a good gas city in spite of high price and poor management of sales department. Failing to push the business of the electric department of the city has had a beneficial effect on gas sales, while stifling the electric industry.

Birmingham is behindhand, with a low percentage of its population as gas consumers.

On the whole, in consideration of the more general use of the prepayment meter, of the lower prices prevailing for gas and the canvassing employed, the conclusion is inevitable that the use of gas by the poorer classes in the towns having privately operated works is more general than in those whose works are operated by the municipality.

(7) The extent to which the municipality has availed itself of the use of gas for street illumination is a question which does not depend primarily on the energy or efficiency displayed in the conduct of the gas business, and hence will not be discussed here. We will confine ourselves to an inquiry as to the terms offered to the municipalities in the two classes of cases. An inspection of the prices charged for the gas used in the street lamps shows that with

the exception of Birmingham, the two company towns of Newcastle and Sheffield charge lower prices than the departments of the municipalities, with the added advantage that in Newcastle the company supplies at its own cost all the new equipment. In London the gas is not sold as such but is included in a contract for Kern lamps for which a rental is paid by the city.

Summing up the inquiry as to the "Character of Users," it may be safely said that our investigation has shown that, in those British cities where the gas business is conducted by private enterprise, gas is used for more diversified purposes, or maintains a greater variety of "Users" than in those cities where the municipality is in charge.

c.—Efforts to Extend.

We now consider the relative efforts of the municipalities and companies to induce the inhabitants to use gas. This effort may be made through advertising, canvassing or attractive show rooms in central locations. The result is in some degree a measure of the social good the undertakings are accomplishing.

We find that the Birmingham, Glasgow and Manchester gas departments do no canvassing. Leicester has three canvassers. Each of the companies has canvassers and a new business department devoting their energies to the extension of the use of gas.

Show rooms conveniently located and efficiently arranged and attended are important factors in the effort to extend the use of gas. At Birmingham the basement of the gas office is devoted to a display, where a small but comprehensive and neatly arranged outfit of appliances is kept. This is the one show room for the Birmingham gas department, supplying a population of 800,000 people.

Glasgow has three show rooms. The Committee visited the central and largest of these rooms. It is here that stoves are shown and instruction given for the use of gas in cooking and other appliances. This show room was insignificant in size and equipment, in proportion to the importance and size of the city of Glasgow. There are in America cities of less than 50,000 population with better gas show rooms.

Manchester makes practically no effort at a display of gas appliances. There is a show room on Deansgate, fair, but small and incomplete for a city of this size.

Leicester has a display room near the center of the city with a small, but good, display of gas and electrical appliances.

The South Metropolitan company, London, devotes the first floor of its main office to a display room, and maintains offices scattered throughout its territory for the purposes of display and demonstration. The main display room is superior to any operated by any one of the municipalities.

The Newcastle company has a display room with a large line of appliances.

The Sheffield company has a large, handsome display room on the first floor of its office, containing a complete outfit of stoves and appliances.

The almost universal practice of companies having an article for sale is to advertise in the newspapers or through circulars. Glasgow does very little advertising and the other municipalities not any. Each of the companies advertises extensively, using the newspapers, circulars and postal cards.

The Newcastle company has twice given exhibitions, running several weeks, to which the inhabitants of the city are invited, that they may be made acquainted with the various uses to which gas may be applied and the economical methods of application. Experienced women are sent to the houses of Newcastle consumers to instruct them in the use of cooking stoves.

The Sheffield company periodically gives a series of lectures and demonstrations of the use of gas for cooking.

Messrs. Newbigging and Klumpp, in their supplemental report, close their consideration of the subject as follows:

> "Summarizing the foregoing, the conclusion arrived at is that whilst gas appliances of every kind may be obtained from either the municipalities or the companies, the latter show greater enterprise in pushing their use amongst gas consumers."

Among the means of inducing the poorer portion of the population to use gas is the offer of an opportunity to pay for the gas as it is used and therefore to avoid the possibility of receiving a bill for an unexpectedly large amount. This is accomplished by the prepayment meter. In some degree we may measure the benefit of a system to the poorer people of the community by the percentage of prepayment meters in use. Four and three-tenths per cent. of Glasgow's consumers use prepayment meters; 64.9 per cent. of the South Metropolitan company's (London) consumers use prepayment meters. Sheffield's method of getting down to the lowest flat rate possible is worthy of notice. The Sheffield company's rate (18d.) is so low that in itself it constitutes a means of inducing all classes to consume gas, and rivals in its results those of the prepayment meter.

Among the efforts to extend the use of gas may be classed any reduction made in the selling prices. The investigation has revealed the following favorable showing for the privately operated plants:

The price of gas has been reduced in Birmingham (municipal) between 1900 and 1906 3d. per thousand cubic feet for ordinary consumers.

The price in Glasgow (municipal) has been reduced 1d. per thousand cubic feet since 1900. It was advanced for the years 1901 and 1902 4d. per thousand cubic feet, and the average price to the consumer during the past three years has been as high as it was in 1900.

This is also true of Manchester (municipal), where the price, having been 2s. 3d. in 1900, was advanced to 2s. 6d. in 1901, to 2s. 9d. in 1902 and 1903, to 2s. 6d. in 1904, and to 2s. 4d. in 1905. The price is now 1d. higher than it was in 1900.

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At Leicester (municipal) the price has been reduced 2d. per thousand cubic feet since 1900.

In London (company) the price has been reduced 3d. with no increase at any time.

In Newcastle (company) the price has been reduced 3d. with no increase at any time.

In Sheffield (company) the price has been reduced 8d. since 1901, the earliest date of which we have record, with no increase at any time.

Schedule IV., question I 13, gives a reduction in price at Birmingham in 1875-6 coincident with the change from private to municipal operation, averaging 3d. per thousand cubic feet, or 9 per cent. That this reduction was not unusual, nor to be credited to the change in method, is shown by the fact that in the same years over 200 gas plants in Great Britain made reductions ranging in the larger towns from five to thirty per cent. In the United States, while the record is incomplete, over 100 cases of reductions, ranging from eight to thirty-seven and one-half per cent. are known. These latter facts are derived from announcements in public print.

We must conclude from our record that the companies investigated are tending to lower rates more rapidly than are the municipalities.

III. COST OF PRODUCTION.

The following figures are taken from the report of the experts:

Municipalities—	*Mfg. Costs per M. in d.*	*Distrb'n Costs per M. in d.*	*General Costs per M. in d.*	*Total Cost per M. in d.*
Birmingham	22.30	2.54	0.57	25.41
Glasgow	21.37	2.98	0.94	25.29
Manchester	17.92	5.03	1.25	24.20
Leicester	17.42	3.58	0.97	21.97
Companies—				
London—So. Met.	19.90	3.67	2.47	26.04
Newcastle	16.72	2.35	1.58	20.65
Sheffield	15.56	2.29	1.26	19.11

NOTE.—In the above figures, credits for residuals have not been deducted.

For obvious reasons London costs are high. The higher prices prevailing in the south of England generally, and particularly within the metropolitan area, for both labor and material easily account for the high costs per thousand in operating expenses. Attention is called also to the large amounts paid in London for damages, injuries and claims. These two items materially swell London's total costs, and show the effect of crowded streets and other metropolitan conditions, and of a liberal policy toward injured employees and citizens. The item of copartnership charges also bulks large in the London account, but the generous copartnership scheme maintained by that company more than justifies this item of expense.

Omitting London, as we must to make the comparison mean anything, but little comment is needed on these figures. The

showing made by the two companies in comparison with the municipal plants is good. It is interesting to note that the companies average a considerably larger amount paid in salaries to officers and to canvassers, etc., and to observe how well this liberal policy is repaid in a lower total cost of product and wider extent of use.

In the cost figures listed above, the returns from residuals are not taken into account, and as these figures have a very material bearing on the profits, it is instructive to consider them here.

The returns from the sale of coke, tar, ammoniacal liquor and other residuals and by-products, are:

Municipalities—	*Residuals per M. in d.*
Birmingham	7.58
Glasgow	7.58
Manchester	5.79
Leicester	7.73
Leicester—	
London—So. Met.	9.43
Newcastle	7.88
Sheffield	10.11

The companies have exhibited greater energy and intelligence in preparing their residuals for market, and in pushing their sale.

The Glasgow department has helped its residual sales by somewhat illogically leasing its residual plants to a private company for operation.

IV. PLANT.

a.—Character.

The word "plant" in this connection is used to cover all the real estate, buildings, pipes, wagons, teams, tools, generating, purifying, storing, distributing and measuring apparatus used in the handling of materials, the manufacture, measurement and distribution of gas, and the handling and utilization of residuals, whether sold in the raw state or converted into other useful products before sale. No material thing that has to do with the physical operation of the gas works, beginning with the removal of the raw material from the boat or car, and ending with the measurement of gas at the consumer's meter, should be excluded from consideration when discussing a gas plant.

The ideal gas plant will have at the works sufficient capacity for the storage of raw materials of manufacture to give it a reasonable assurance against shortage during strikes, lockouts or other causes tending to prevent the delivery of materials by contractors. It will have sufficient generating, purifying and holder capacity to enable the management to supply to consumers at all times as much gas as they desire to take, with such proper proportion of generating and purifying capacity to holder capacity as will enable the works to be run uniformly any twenty-four hours. Where the use of labor-saving machinery will lead to a reduced cost of gas or, other things being equal, will tend to reduce the necessity of hard and debasing labor, it should be introduced. The

plant should be so equipped with the necessary tanks, pumps, etc., that all residuals may be saved for utilization or sale. The works should be kept clean and made as attractive as reasonably possible. They should be rendered as safe as possible for the workmen and the casual visitor, and the fire risk to buildings of the plant, or on adjacent property; eliminated as far as practicable. The mains, services and consumers' meters should be of such size as to enable all consumers to obtain gas to meet their maximum requirement at any time, and of such size as to maintain throughout the distribution system a pressure of gas suitable to all the purposes for which gas may be required and with the least practicable variation.

In general it is very difficult to compare the gas plants of the municipalities and those of the private companies, as there are many manufacturing stations in each case. The conditions under which the works have been built are not all known to us, and practically all that we can say, after reading the reports of the engineers, is that, in new work, the private companies are more alive to the necessity of saving money in construction and arranging to save money in operation.

Each plant examined had sufficient storage room for the necessary quantities of raw materials of manufacture. Each plant, except Manchester, had sufficient generating, purifying and holder capacity.

One of the works at Birmingham, the Adderly street; one of the works at Leicester, Belgrave Gate; one of the works at Newcastle, the Elswick; one of the works at Sheffield, the Effingham street; are old plants, with some hand charging, and some direct fire, benches. The one large, fine, modern plant, built for efficient and economical operation, is the East Greenwich plant at London. Leicester had, undoubtedly, the cleanest and, to the eye of the layman, the most attractive plant. There was, however, from the engineer's point of view, little to say in commendation of it.

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The Newcastle company's plants have practically reached the limit of their capacity and provision has been made for the development of the St. Anthony's property at the eastern end of the city, where a large storage holder has been erected. The plans for the new works are finished and have been approved by some of the best consulting engineers of the country.

One point that may be particularly noted is the large investment of the municipal undertakings in preparing the sites for their works—the enormous amounts spent on boundary walls, on roads and bridges and on elaborate, and in many cases unnecessary, railway sidings and trestles. This is particularly noticeable at Provan, Glasgow; Aylestone, Leicester; Windsor street, Birmingham; Nechels, Birmingham; and Tradestone, Glasgow.

The introduction of modern apparatus has been fairly general in all of the undertakings examined, but the companies have shown more initiative in seeking every appliance that would tend to reduce operating costs. London's experiments of installing benches of twenty to a setting, of placing their station meters underground without housing, of adopting outside producers at Old

Kent road, and of installing the gas-engine-driven coke-buggy-haulage and trestle; Sheffield's introduction of the same coke-haulage buggy, gas-engine driven, which has resulted so satisfactorily in producing an unsurpassed grade of coke; and Newcastle's installation of the electric Debrower charging-and discharging machines, indicate a tendency to adopt the best and cheapest methods and to experiment along any promising lines.

In the installation of labor-saving machinery, the companies have exhibited more intelligence than the municipalities. An instance of engineering error in the installation of labor-saving machinery was found in Glasgow, where the coke handling apparatus was extravagant and, in the opinion of the experts, could not justify itself. Another instance is the entire absence of labor-saving devices in the Leicester works. The experts, commenting on the Aylestone works, the principal plant in Leicester, say:

> "The Aylestone works is rather elaborately laid out and is noticeable by the absence of any labor-saving devices, all materials being handled by hand, including the charging and discharging of the retorts."

Birmingham appears to have introduced labor-saving machinery before being persuaded that it was economical, for the plant is being run without the coke handling apparatus in operation in an effort to determine whether the latter is economical. Inasmuch as coke handling apparatus is no experiment, the engineers at Birmingham might have satisfied themselves that it was economical before introducing it. We were told that the real reason of the test is that one faction of the committee is endeavoring to put the other faction in the position of having introduced machinery that did not lessen operating costs.

In Birmingham a large, heavily constructed building intended originally for a retort house has been standing empty and idle since the time of its erection, 1904. The house was for some reason built several years in advance of the time when it would be needed. It was evidently designed to contain inclined retorts, but the management had not determined the type of setting. Another point to criticise in Birmingham is the storing of all coal in the open, a practice unusual in England. All stored coal must be handled at least twice by hand before it is fed to the elevating conveyors. At the Windsor street plant the coal must be shoveled from the cars, even though they come into the building.

The coal unloading facilities at these points, as at the new plant at Leicester, were in poor contrast with the coal handling facilities at East Greenwich, London; Rotherhithe, London; Old Kent Road, London; Vauxhall, London; Grimesthorpe, Sheffield; and Provan, Glasgow.

The relative extent to which the distributing systems meet the demands of the cities may be determined by a comparison between the amounts of money expended for generating plant and for the distributing systems. Taking all the companies together, 55.2 per cent. of the total investment is for works and 44.8 per cent.

is for distributing system. In comparison, 63.5 per cent. was expended by municipalities for works and 36.5 per cent. for distributing system. Inasmuch as each of the companies has provided sufficient plant to keep its consumers properly supplied, these figures indicate a greater enterprise on the part of the companies to obtain business and a better opportunity for the citizens to obtain gas.

The experts found that the Glasgow department was unable to give the mileage of mains or the various sizes laid; the mileage given is estimated. Their reports to authorities state only the number of miles of streets supplied. Leicester did not have this information, but scaled the maps for the large sizes and assumed the balance as four-inch and five-inch.

Manchester, Birmingham, London and Sheffield have lists of the mains in detail as to lengths and sizes. Newcastle's old records were not complete, but records for the past seven years' work have been kept in detail.

The Manchester department's method of laying mains, in many cases in concrete, seems an unnecessary expense and has not been adopted elsewhere. The Sheffield company, owing to the poor quality of the soil—ash refuse having been used in a general raising of grades—has been compelled to go to the expense of installing lead services and brass fittings. These services will, however, outlast ordinary iron services.

The practice of Manchester in having all meters and meter connections installed by plumbers employed by the consumers is bad and results in a lack of uniformity in style and character of work. Inspection and supervision alone will not overcome this.

Considering the total investment in the plants, which of the two classes of undertakings can show the most for their money? In other words, on which side has the money invested in plant been the most efficiently and economically spent? There are many points from which this subject may be viewed. One is a comparison of the money invested in plant per thousand cubic feet capacity of plant. Into this comparison manifestly, the distributing plant should not enter, as a liberal policy in extending it is commendable, and a high investment in distributing plant per unit of manufacturing capacity may merely reflect local geographical conditions, or other conditions independent of economical design. But the money invested in land, buildings and apparatus at the works in terms of the unit of manufacturing capacity should represent, as closely as any set of figures where so many variable factors exist can represent, a true comparison between the different plants.

Municipalities—	*Investment in Works, £ Per M. Cu. Ft., Capacity of Works.*
Birmingham	44.3
Glasgow	48.9
Manchester	54.7
Leicester	45.4

Companies—	*Investment in Works, £ Per M. Cu. Ft., Capacity of Works.*
London—So. Met	40.1
Newcastle	54.1
Sheffield	47.4

These figures indicate no very wide difference in conditions in the two classes of plants. Taking them as they stand, it is evident that the companies make rather the better showing. The lowest investment per unit in the list is a company plant; the highest is a municipal plant; the highest two of the company plants are exceeded by the highest two of the municipal plants.

But it is evident from a moment's thought that there are many disturbing factors, which prevent these figures forming a fair comparison. For example, some of these plants have water gas apparatus, while others have not. With this type of apparatus, a large capacity is obtained with small investment, so, in order to eliminate this factor as far as possible, we have deducted the investment in water gas plant, and the water gas capacity, with the result here given:

Municipalities—	*Investment in Works, Coal Gas, £ Per M. Cu. Ft., Capacity of Works.*
Birmingham	56.2
Glasgow	48.9
Manchester	69.1
Leicester	54.2
Companies	
London—So. Met	40.1
Newcastle	58.2
Sheffield	47.4

This shows even more favorably for the companies.

b.—Extent of Service.

The question of the extent to which the management has extended its service throughout the territory in which it is authorized to operate has been treated to a certain extent in the chapters on Extent of Use, and Character of Users. It was there shown that in proportion both to the numbers of the population and to the variety of the purposes, the use of gas was more extensive in the privately operated plants.

The answer to questions H-39 to H-50, inclusive, regarding the terms on which, and the promptness with which, extensions of the gas mains are made, are quite inconclusive as to any definite advantage of one class over the other. In general it may be said that the applying citizen is most apt to be listened to and promptly served where the electric light competition is most keen. The municipalities have little competition; controlling both industries and discouraging the electric. The companies have keen competition.

c.—Operating Efficiency

Operating efficiency is a function of management. It does not seem possible that the detailed operation of gas properties can be properly maintained by bodies such as those that are in charge of the municipal gas departments.

At Birmingham, the jealousies and friction between the departments must render any management inefficient.

The Glasgow gas undertaking is handled by a very complicated committee system. The engineer or general manager must spend much valuable time meeting so many committees. He says he does.

Manchester seems to have reached the limit of absurdity in its system of management. A committee of twenty-two is divided into three sub-committees, each in charge of one of the gas works. The policy, in operating and extending the individual works, is subject to the individual sub-committee. This will almost certainly result in a lack of uniformity in design at the different works, and in the introduction of apparatus at one works that would better be in another works, or perhaps in none of the works.

At Leicester, the management is arranged on a more reasonable basis.

The management of the companies is the same as that of companies generally, is what has been dictated by experience as the best for obtaining good results, and is independent of any man's social or political ambitions.

On the question as to the reports received regularly by the engineer, the replies indicate that the managers at Newcastle and Sheffield receive more detailed reports than those received by the municipal engineers. The experts comment particularly on the fact that the engineers of the companies receive daily information, not only of the results of operation, but of the conditions of operation—*i. e.*, pressures, candle power, etc.

We cannot discuss operating efficiency without discussing, more or less, the character of the plant operated. It does not follow that the plant which is getting more of product from a unit of labor or unit of material, is more efficiently operated. We must consider also what expenditures have been made for the installation of appliances that tend to economize labor or material, and whether such expenditures have resulted in a commensurate saving in labor or material. To illustrate: The Provan Works, at Glasgow, has a coke-handling plant that handles coke with a small labor account, but with an investment in apparatus, as we believe, disproportionately great. In comparing the Provan plant with the plants at Grimesthorpe, in Sheffield, or East Greenwich and Old Kent road, in London, we must recognize that there are other things than labor costs to be considered. The wear and tear on the coke-handling apparatus at the Provan plant must be very large in comparison with that of the coke-handling plants of the Sheffield or London companies at Grimesthorpe, at East Grenwich or Old Kent road. Moreover, the coke-handling apparatus at Provan is very destructive of coke, the result being a larger

proportion of breeze than would be found at East Greenwich, Old Kent road or Grimesthorpe, if the same kind of coal were used at these places. This is an engineering question, upon which we can have a definite opinion, but we cannot, in the absence of the necessary data, tell how much less efficient, on the whole, the Provan coke-handling plant is than the coke-handling plants of the companies.

The policy of the Birmingham management in not operating their works on Sundays may result in good to the employees, but it will certainly result in injury to the gas plant. The gas plants of Great Britain, municipal and private, are generally managed by humane men, who endeavor to do what their circumstances permit for the betterment of the conditions of laboring people. So far, in Great Britain, as elsewhere, Sunday work in a gas works is felt to be imperative. This does not necessarily mean that the employees must work every day.

Glasgow purifies its gas solely with lime. This appears to be because they own limestone quarries. It is the opinion of the experts that it would be cheaper and less productive of nuisance to use oxide of iron.

The operating efficiency of the municipal plant at Manchester must be regarded as low, however cheaply Manchester may put gas in the holder, because we have definite information from the engineer of the Manchetser plant that he is required by his Gas Committee to employ more labor than is necessary. He said to Mr. Walton Clark and other members of the committee that if his committee would let him, he could conduct his operation with one-third less labor than he was employing.

He has every practicable labor-saving device, but cannot realize the advantage of them because of the demands of politicians.

The operating efficiency at Leicester is low, because of the fact that no labor-saving appliances of importance are in use.

It is not to be understood that the beauty of the Leicester municipal works is not without cost. The engineers say of the Leicester plant: "The plant is continually being brushed by a cleaning gang to extravagance." At Leicester, also, while the clerks are conveniently assembled in a room beautifully adapted to the work so far as furniture is concerned, each of them faces a strong light all the time he is at work.

In the operation of the gas producing machinery, the Sheffield and London companies are, undoubtedly, handling more coal, and charging more retorts, per charging machine than any of the municipal undertakings.

The financial results of the companies' residual accounts show their superiority over the municipalities. This is due to two reasons: First, the capability of the companies to drive a better bargain in the disposal of these commodities, and second, the better quantity of coke, tar and ammonia produced per thousand cubic feet of gas made, and the better methods of preparing them for the market.

The Sheffield company has developed a good coke trade by unusual and intelligent efforts to produce, and sort, a coke suitable to the various industries at hand. It has even gone to the extent of regulating the length of the retort charges for the betterment of the coke.

The London and Newcastle companies have both treated this matter with great foresight, and have adopted means for handling the coke that will better prepare it for the manufacturing and domestic trade.

Glasgow's receipts for coke are low, due to the rather slaty coke obtained from the Scottish coals, and to the inefficient method of handling.

Manchester, with inclined retorts and elaborate coke handling machinery, shows coke sales that are lower than any undertaking except Glasgow, while Leicester and Birmingham are both considerably behind the companies, as will be seen by the following table:

Coke Receipts per Thousand Feet of Gas Sold.

Municipalities—		
Birmingham	4.0284	pence.
Glasgow	2.7633	"
Manchester	2.9901	"
Leicester	3.8965	"
Companies—		
London—So. Met.	5.4832	"
Newcastle	4.9853	"
Sheffield	5.4057	"

These figures are the more remarkable in view of the relatively low prices of coal in Newcastle and Sheffield, which would tend to a low return from coke.

Consideration of the general situations in Birmingham and Manchester shows that we need not look to details for evidence of inefficiency of operation. At Birmingham, such is the jealousy between the engineer and the secretary of the Gas Committee, that the secretary, having the greater influence with the Committee, has secured the appointment of a chemist, who does not report to the engineer. The chemist operates, independently of the engineer, an experimental plant, with a capacity of 60,000 cubic feet of gas a day, and, in pursuance of instruction from the Committee, makes experiments of various kinds in the works. It is evident that this is a very inefficient method of conducting work.

At Manchester, the division of the Gas Committee into three sub-committees, each in charge of one of the plants, has already been described. It would be difficult to conceive a less effective method of insuring efficiency of operation. On this point the experts report as follows:

> "These works, being under the exclusive orders of three different sub-committees, show evidence of different plans of construction and various types of coal gas

benches, charging and discharging machinery and coal and coke handling apparatus having been installed.

"While these are constructed and operated under the same engineer, he cannot advocate all types with the same interest and with a view towards increasing the efficiency of operation of the entire plant. In other words, the engineer is more or less bound to accept what the sub-committees dictate."

Mr. Newbigging, one of the experts, would substitute for the first paragraph of this quotation the following:

"The system of working without a responsible chief was found to be bad, and the Gas Committee, recognizing this, appointed a chief engineer with control over all the works, and under whose guidance and advice the works will be extended and developed along the lines which, in his opinion, are the best suited to the prevailing conditions."

Mr. Newbigging's suggestion indicates that the system of working has been bad, and that they hope to better it by appointing a chief engineer, with control over all the works. It must be remembered, however, that this chief engineer is still under orders of the Gas Committee, and the Gas Committee is still divided into three sub-committees, each one in charge of, and jealous for, the reputation of a different works.

The efficiency of the welfare work of the municipalities was of a low order. At Glasgow, with beautiful toilet and bath rooms and mess hall, the convenience and comfort afforded is small, one cause of which is, that the men cannot take advantage of them, without exposing themselves to the weather.

At the Aylestone works, in Leicester, with upward of 600 employees, but 70 avail themselves of the club room, although the rates are so low that any employee might afford it.

At the companies' works, the accommodations for the men were uniformly where the men could readily get at them, and it was reported to us that they were generally used.

Our experts were informed at Manchester that the distribution work is being performed inefficiently and at a high cost, and that the meter shop in particular is in bad condition.

Our experts were not able to spend sufficient time in any city to learn of their own knowledge how to answer questions H-52, 53, 54, 55, 56, 57 and 58, regarding contract and street work, and the promptness with which it is performed. This is a matter of considerable importance, and it is to be regretted that we have no information except that given by the officials. We know that municipalities do not check up work in the streets done by one of their own departments as thoroughly as they do any work done by the companies.

An important phase of operating efficiency pertains to the question of leakage, or unaccounted-for gas, per mile of main. As between different undertakings, this figure may serve as a partial

index of the relative tightness of the mains and services, and of the condition of the consumers' meters.

Municipalities—	*Leakage Per Mile of Main.*
Birmingham	464 M.
Glasgow	624 M.
Manchester	168 M.
Leicester	344 M.
Companies—	
London	486 M.
Newcastle	505 M.
Sheffield	191 M.

There are many uncertain and variable factors which affect the comparative value of these figures. Unfortunately we have not the data necessary to convert them to the equivalent of one size of main. Again, in many of the works of Great Britain, no corrections for temperature and barometric pressure are made of the readings of the station meters. It is probable that, in different cities, the gas is delivered to the station meters at different temperatures, depending upon the methods of treating the gas in the different works, thus affecting the leakage figures.

The table shows no great difference in the leakage figures as between the two classes of plants. The low figure for Manchester would seem to reflect the very high expenditure made in that town for turned-and-bored joints in the gas mains, many of the latter being laid on a concrete foundation. It seems that Sheffield obtains almost as good results without resorting to such an expensive method. One would look for the leakage per mile of main in London to be higher than elsewhere because the average size of its mains is larger, its streets are more congested with other underground structures, and its mains are more often disturbed by openings dug by outsiders than in the case of any other city in the list.

There is nothing to be said in praise of the leakage figures in Newcastle, although the much advertised undertaking in Glasgow goes it one better in the race for the booby prize.

V. LABOR.

This subject has been treated fully in the Labor Report, covering the question of labor generally, with reference to gas, electric and street railway undertakings. Consequently no argument on this subject is made here.

VI. COMMUNITY.

These two topics are of a nature so general that they can best be treated by general articles, covering all the classes of business investigated. Therefore no attempt has been made to construct arguments here with reference to the gas business alone. Such questions as the health and the convenience of the community are less important phases of the gas question than they

are of the water and street railway problems. Undoubtedly a general use of gas for cooking purposes has a definite and important effect on the health of the community, and the cheapness and ease with which gas at adequate pressure may be obtained for industrial purposes from the companies is an undoubted convenience and social good to the community. The preceding discussion has shown that the municipalities have not done so well by their customers in these particulars.

Again, the question of employees as a factor in politics, and the question of the effect of public employment on the progress and enterprise of the individual, apply no more powerfully to the employees of the gas department than to those of the other departments investigated. A man working for a gas company operating under Parliamentary law is certainly, politically speaking, more independently situated than if he were employed by the gas department of the city government. He, at least, is free from the possibility of being forced to make political assessments, he works with the assurance that energetic, original or efficient work on his part is more certain to be rewarded by promotion.

On the question of the relative conditions of employment, this seems an appropriate place to quote from the engineers' supplemental report. The first quotation is written by Mr. Klumpp, one of the gas experts; the second quotation is written by Mr. Newbigging, the other gas expert. Mr. Klumpp says:

> "Generally speaking, the majority of the gas engineers—both municipal and private—that were encountered spoke favorably for private management from an engineering point of view, stating that they were allowed greater freedom in the adoption of their plans, and that the salaries paid to the engineers in charge and the men of ability were always better than those paid for a corresponding position by municipally operated undertakings.
>
> "In several cases municipal engineers stated that they had to sacrifice their judgment by the adoption of plans which they knew were not best for the undertaking. One engineer in particular stated that after he had installed labor saving devices he was not allowed to discharge his men whose work had been displaced by these machines."

Mr. Newbigging says:

> "Generally speaking, the majority of the gas engineers—both municipal and company men—spoke favorably for company management from an engineering and personal point of view, stating that boards of directors allowed their engineers and general managers greater freedom in putting into practice their ideas and plans, and that the salaries paid to engineers in the employ of companies were always better than those paid for a corresponding position by municipally operated undertakings.

"Nevertheless, the history of gas enterprise in Great Britain shows that the municipalities have always been able to command the services of gas engineers of the first rank notwithstanding that the remuneration is less, and that they have not the same freedom of action possessed by engineers employed by gas companies.

"That there was a tendency on the part of municipalities to delay the installation of up-to-date and labor saving plant, on the score that it would throw a number of men out of employment, will hardly be questioned. It is a matter for congratulation that the great majority of municipalities do not take this narrow view, and that they do not hesitate to install plant when such a plea only can be put forward against its adoption."

Commenting on this last quotation, it is true that in many cases the municipal trading undertakings have, in the past, secured the services of high grade engineers, but there is a growing impression in England that a change is now taking place, as stated by Mr. Charles A. Wood, manager of the Bradford Municipal Gas plant, in his address as President of the British Gas Institution, June, 1906.

In this place may fittingly be added the following comments on the interest taken by the public in municipal gas undertakings. We find in Dr. Maltbie's summary of Schedule No. 1, in answer to Question B-18, "Are the results of such examinations published (examination of candle power)?" the following: "Birmingham, only occasionally; Glasgow, yes, in minutes of the Council; Manchester and Leicester, none at present; Companies, yes." The fact that the public do not demand the publication of the results of tests from municipally operated works emphasizes Dr. Maltbie's statement in reply to Question A-13, "Do citizens take an active interest in the management of the plant?" under the heading, "Municipalities": "Not generally, for there are few matters now before the department of general interest." Apparently, the citizens of municipalities operating gas plants are not seriously concerned with the operation; do not regard the operation of the gas plant as a matter of general interest, and do not take that interest in it which is advanced as one of the arguments in favor of municipal ownership and operation. The lack of interest in municipal plants indicates a general indifference on the part of the public to a condition that they tolerate because they know not how to remedy.

On a superficial view, the fact that municipal undertakings contribute some of their earnings to the city treasury, and thus aid in reducing the tax rate, seems an advantage gained by that method of operation. Leaving aside the question of injustice involved by a system of relieving the taxpayer at the expense of the gas consumer, let us examine, in the municipal plants investigated, what would have been the effect if the companies' prices had prevailed. In the figures given below, the prices used are those shown on page 314, under "Price to Consumer," on the assumption that the consumer used 30,000 cubic feet of gas per year.

Glasgow cannot enter into this comparison, because that city has been, for many years, prohibited by Act of Parliament from applying any of the profits from its gas undertaking to the reduction of taxes. London is omitted because of its widely different conditions.

In the year covered by this investigation, if, in the city of Birmingham, the Newcastle price of gas had prevailed, the consumers would have been £262,600 better off; if the Sheffield price had prevailed, the Birmingham gas consumers would have saved £348,500. The amount paid by the Birmingham gas undertaking into the common good was £69,813.

In the case of Manchester, if the Newcastle price had prevailed, the gas consumers would have saved £47,500; at Sheffield's price they would have saved £111,400. The amount contributed to the city treasury by the gas business was £60,000.

In the case of Leicester, at Newcastle's price, the consumers would have saved £65,200, while if Sheffield's price had obtained they would have saved £90,500. The amount contributed by the gas business to the common good was £43,466.

To meet any criticism that the prices for gas used above (page 314) are based on the assumption that a gas stove is being used by each consumer, figures similar to the above have been made, using the average prices for gas (omitting stove rents, etc.) as listed on page 313 above, with the following result:

Table Showing Saving to Gas Consumers.

	If Newcastle Company's Prices Had Prevailed.	*If Sheffield Company's Prices Had Prevailed.*	*Contributed in Aid of Rates in 1905.*
	£	£	£
Birmingham Municipality.	142,585	216,455	68,813
Manchester Municipality..	140,955	195,913	60,000
Leicester Municipality....	56,631	78,439	43,466

What return do the gas consumers get for this enormous premium they pay toward the reduction of the tax rate? Do they obtain a better service? Do they have gas of higher and more uniform candle power? It has been shown that they have none of these advantages.

These figures are in part based on the results of one year's operation. If there had been ample time and money at the disposal of the committee, it would undoubtedly have been instructive to have included a period of several years within the scope of this investigation. The results for any one year taken from the records of seven going concerns—concerns all of which have been operating on the present basis for a long term—are without doubt, indicative of their relative merits; but further and more enlightening figures are found in the following comparison for a five years' period abstracted from "Field's Analysis," a work generally accepted as authority by British engineers.

In "Field's Analysis" of the accounts of the principal gas undertakings for the year 1905 are shown some comparisons of the chief items from the years 1901 to 1905, inclusive, on next to the last page of these "Accounts," among the municipalities of

Birmingham,
Bolton,
Bradford,
Carlisle,
Leicester,
Manchester,
Nottingham,
Oldham,
Salford,
Edinburgh and Leith,
Glasgow,

and the companies of

Bath,
Brighton,
Newcastle,
Plymouth,
Portsea,
Rochester,
Chatham,
Sheffield,
Dublin,

and the company of South Metropolitan, London, which we give in a separate column.

These comparisons are as follows:

Capital Employed per 1,000 Cubic Feet of Gas Sold.

	Municipalities.	*Companies.*	*London S. M.*
	s. d.	*s. d.*	*s. d.*
1901.....	10 7	9 4	8 3
1902.....	10 7	9 6	8 7
1903.....	10 10	9 9	8 10
1904.....	11 0	9 10	8 9
1905.....	11 1	9 11	8 8

Working Expenses.

	Municipalities.	*Companies.*	*London S. M.*
	d.	*d.*	*d.*
1901.....	13.15	13.63	15.27
1902.....	13.57	13.26	15.20
1903.....	13.67	13.47	16.47
1904.....	14.10	13.32	15.98
1905.....	14.07	12.93	15.07

Average Price of Gas.

	Municipalities.	*Companies.*	*London S. M.*
	d.	*d.*	*d.*
1901.....	28.9	26.9	28.7
1902.....	29.9	26.1	26.4
1903.....	29.4	25.3	26.5
1904.....	28.2	24.3	24.1
1905.....	27.2	23.3	23.6

Cost of Coal.

	Municipalities.	*Companies.*	*London S. M.*
	d.	*d.*	*d.*
1901.....	17.95	18.27	19.39
1902.....	16.32	14.56	15.12
1903.....	14.36	13.34	13.98
1904.....	13.28	12.67	13.09
1905.....	12.28	12.07	12.84

Increase in Gas Sold.

	Municipalities. *Per Cent.*	*Companies.* *Per Cent.*	*London S. M.* *Per Cent.*
1901	1.82	4.03	4.23
1902	2.26	1.89	3.39
1903	1.42	1.49	1.76
1904	1.89	3.58	3.48
1905	.61	2.40	1.32

Gross Profit per 1,000 Cubic Feet of Gas Sold.

	Municipalities. *d.*	*Companies.* *d.*	*London S. M.* *d.*
1901	6.96	5.95	8.22
1902	7.78	8.63	8.35
1903	9.99	9.46	9.27
1904	9.64	8.89	7.93
1905	8.67	8.18	7.60

Net Profit per 1,000 Cubic Feet of Gas Sold.

	Municipalities. *d.*	*Companies.* *d.*	*London S. M.* *d.*
1901	3.08	5.08	6.56
1902	3.88	7.60	7.09
1903	4.90	8.52	7.71
1904	5.34	7.75	6.58
1905	4.81	7.15	6.32

Residuals, Per Ton of Coal.

	Municipalities. *s.* *d.*	*Companies.* *s.* *d.*	*London S. M.* *s.* *d.*
1901	7 3.9	8 0.6	9 6.2
1902	6 4.3	7 6.5	8 4.7
1903	7 4.7	8 0.4	9 4.9
1904	7 9.1	7 9.1	9 1.5
1905	6 11.0	7 3.8	8 1.6

Cost of Coal, Less Residuals, per 1,000 Cubic Feet of Gas Sold.

	Municipalities. *d.*	*Companies.* *d.*	*London S. M.* *d.*
1901	9.36	8.83	7.10
1902	9.15	5.89	4.84
1903	6.23	4.21	2.86
1904	4.95	3.96	2.42
1905	4.93	4.07	3.29

Coke, Per Ton.

	Municipalities. *s.* *d.*	*Companies.* *s.* *d.*	*London S. M.* *s.* *d.*
1901	10 7.4	12 5.6	15 9.8
1902	8 8.0	10 3.5	12 6.1
1903	9 3.4	10 10.0	13 4.7
1904	9 5.6	10 8.6	12 3.4
1905	7 7.4	9 8.3	10 4.1

Municipalities.	*Total Quantity of Gas Made in the Account Year.*	*Proportion of Maximum Daily Delivery to Annual Make.*
Birmingham	6,908,178	1-211th
Glasgow	6,449,539	1-174th
Manchester	5,008,544	1-187th
Leicester	1,938,534	1-221st
Companies.		
London—So. Met.	12,859,712	1-240th
Newcastle	3,254,383	1-210th
Sheffield	2,936,137	1-199th

Some of the comparisons instituted in this chapter are of methods and results affected by undetermined conditions. Thus quality of coal used—affecting cost of production; character of soil—affecting cost of pipe laying and leakage—are unknown to us. But many—and from the view point of the social good, the most important items of management—are positively determined. We know from the records of the investigation that municipally produced gas costs the consumer more than company produced gas; that the companies maintain better conditions of supply; provide better facilities for their customers and workmen; extend the opportunity to enjoy the benefits of gas service to a larger proportion of the people; more efficiently advise their customers and others of the benefits to be derived from the use of gas for new and various purposes; attend more energetically and intelligently to the demands of their consumers; and in general perform the functions for which gas suppliers are created better and more efficiently than do the municipalities; better conserve the energies of the nation, and so prove themselves a more potent factor for good to the customers they serve, to the communities in which they operate, and to the world.

The decision upon points of which we have not knowledge of all the pertinent conditions must, on the data we have, be favorable to company ownership. The decision upon points of which we know all the pertinent conditions must be, without qualification, favorable to company ownership.

CHAPTER III.

BRITISH ELECTRIC LIGHTING UNDERTAKINGS.

Electric lighting, now an established industry, has rapidly passed through several successive phases. A succession of new inventions has revolutionized the industry, and the success of individual plants has depended on the progressiveness and individual ability of owners, managers and engineers more in this industry than in any other public service enterprise. The business itself, while not so complicated as that of manufacturing and selling gas, has required for its proper development, courage, foresight and great technical knowledge and engineering skill. It is therefore in this

field that the ability or inability of municipalities to find and to take advantage of new ways and means, and to adapt themselves to new conditions will be most likely to appear.

For the purposes of this report, the Commission has examined nine prominent plants in Great Britain, namely: The Municipal plants of Glasgow, Liverpool, Manchester and the Borough of St. Pancras (London); and the Private plants operated by the City of London Electric Light Company, the St. James and Pall Mall Electric Light Company, the Westminster Electric Supply Corporation, and the Central Electric Supply Company, all of which are in London; the Newcastle and District Electric Light Company, and the Newcastle-upon-Tyne Electric Supply Company, which operate in and around Newcastle-upon-Tyne.

The electric situation in England has been complicated by the fact that when electric lighting was introduced British municipalities had already extensively embarked in municipal gas undertakings. In order to save their gas enterprises from the inroads of the newer business, these municipalities assisted in getting laws passed so restrictive as, at first, practically to exclude private electrical enterprise, and refused energetically to develop municipal electric plants, thus practically depriving their inhabitants of this more modern form of lighting, and of the advantages of electrical energy as a mechanical power.

This opposition, supported by legislative enactment, so retarded the development of electric lighting and power that even now, after the lapse of a considerable period of years, electric plants that, judged by American standards, are well equipped and in keeping with up-to-date methods of the art are seldom found in England. Methods of distribution, especially, show this—methods that were long ago discarded in America as inefficient and uneconomical.

I. SERVICE.

a.—Price to Consumer.

The first question that arises in discussing the success or failure of municipal ownership is the price to the consumer.

Prices for various kinds of electrical service vary so widely and depend upon such intricate details that to compare the schedule of rates of various undertakings gives but a confused impression. Receipts per K. W. H. sold can be easily compared, however, and the receipts per K. W. H. sold being the same as the average price per K. W. H., such a comparison is equivalent to, and more effective than, an attempted comparison of prices.

A tabulation of the total sales of the various undertakings examined shows that the following are the receipts of each K. W. H. sold in pence:

Municipalities—	*d.*
Glasgow	2.451
Liverpool	1.839
Manchester	2.143
St. Pancras	2.526

Average, 2.128d.

Companies	*d.*
Newcastle—Supply	.967
Newcastle—District	1.508
City of London	2.757
St. James	3.430
Westminster	3.624

Average, 2.219d.

It will be noticed from this table that the receipts or prices of the City of London, St. James, and Westminster Companies, and of the Borough of St. Pancras, are higher than those of the other undertakings. This is due to higher costs, caused by the fact that labor and materials in London, as is common in large cities, are more expensive than elsewhere; that the cost of land and the difficulties of laying and maintaining a distributing system are greater in large cities; and that advantageous locations for operating cheaply cannot be chosen at will, and in some instances are not obtainable.

The Borough of St. Pancras has the highest receipts per K. W. H. sold, of any of the municipal undertakings, but it shows a lower figure than the London companies, for the reason that it charges itself only 1½d. per K. W. H. for the 20 per cent. of its output which is sold to itself for street lighting. The receipts of the Central London Company are 1.777d. per K. W. H., but they are not comparable with those of the other undertakings for the reason that the company sells all of its current at the bus bar, to the St. James and Westminster companies, and has no distribution expenses.

Of the undertakings outside of London the poorest showing is made by Glasgow, where an average charge of 2.451d. per K. W. H. is higher than would be expected, considering the reputed ability of that city to operate its public services, and considering that it supplies a congested area, and that labor, material and coal are cheap.

The receipts per K. W. H. sold, which are 2.143d. at Manchester, and 1.839d. at Liverpool, though considerably lower than those of 2.451d. at Glasgow, seem high when compared with those of the efficient Newcastle companies, which are respectively 1.508d. per K. W. H. for the Newcastle and District Company, and .967d. per K. W. H. for the Newcastle Supply Company. Especially is this so when it is remembered that two-thirds of Liverpool's business consists of current delivered to its own tramways.

In the matter of price, the success of the Newcastle Supply Company indicates what can be done. Its receipts per K. W. H. are hardly more than half those of Liverpool, and are considerably less than half those of Glasgow or Manchester, cities world-famous as among the best examples of municipal electrical undertakings. To some extent this difference is due to the cheaper cost of coal in Newcastle, but that the difference is due in a much greater degree to the superior operating efficiency of the Newcastle Supply Company is demonstrated by the following table:

Receipts per K. W. H. sold...	Glasgow.	2.451d.	Liverpool.	1.839d.	Manchester.	2.143d.
	N. S. Co..	.967	N. S. Co...	.967	N. S. Co....	.967
Difference in favor of Newcastle S. Co..... =		1.484d.		.872d.		1.176d.
Cost of coal per K. W. H. sold.	Glasgow.	.215d.	Liverpool.	.270d.	Manchester.	.260d.
	N. S. Co..	.123	N. S. Co...	.123	N. S. Co.....	.123
Difference in favor of N. S. Co..... =		.092d.		.147d.		.137d.

Difference in receipts per K. W. H. sold, minus difference in cost of coal per K. W. H. sold (as above) between

Glasgow ..... and Newcastle S. Co....	1.484d. .092	
	1.392d.	= difference in receipts per K. W. H. sold in favor of Newcastle Supply Co. not due to difference in cost of coal.
Liverpool ..... and Newcastle S. Co....	.872d. .147	
	.725d.	= difference in receipts per K. W. H. sold in favor of Newcastle Supply Co. not due to difference in cost of coal.
Manchester ..... and Newcastle S. Co....	1.176d. .137	
	1.039d.	= difference in receipts per K. W. H. sold in favor of Newcastle Supply Co. not due to difference in cost of coal.

(See Marwick & Mitchell's Report on Electricity in England.)

A summary of the receipts per K. W. H. sold, shows that, whereas the municipalities have received on the average .091d. per K. W. H. less than the companies, including the comparatively high-cost companies in the heart of London, they have not approached the low receipts per K. W. H. of the Newcastle companies.

In considering English prices, Americans should realize that as a rule neither municipalities nor private companies in England furnish free lamp renewals, free meters, free connections, or any of the other free services which are commonly rendered in this country.

Reductions in price are gradually being made by both municipalities and private companies. Since 1900, for instance, all of the companies and municipalities have made voluntary and, in some instances, material reductions.

Exhibit A, at the end of this chapter, shows the street and commercial lighting, power, and bulk sales of each of the companies investigated, and the receipts per K. W. H. from each class of business.

b.—Character of Supply.

The general character of electric service adopted by the English undertakings is that of a three-wire direct-current system of about 440-220 volts.

The use of a high-voltage direct current means that all customers are compelled to use lamps which require 3.8 or 4 watts to produce one candle power. Under the company practice general in the United States, consumers can use lamps which give a candle power for 3.1 watts, or even for 2.5 or 2 watts. The economy thus resulting is denied to consumers in England, as is also that obtained by the adoption of the new vacuum tube lamps, which are now showing some promise. Glasgow, Manchester, Liverpool, and several of the London companies adopted the 440-220 volt service to avoid making the installation of copper, necessary to deliver current by the low-potential direct-current system, and had not the foresight to supply high-tension current through sub-stations.

All of the undertakings examined are now adequately equipped to handle their maximum demand without lowering the character of the service. In the Newcastle and District Company, however, an interruption occurred recently through an explosion in a junction box, and in December, 1904, Manchester's plant was overloaded to such an extent that it was necessary to cut out certain sections of street lighting, and even then the plant was unable to supply an adequate potential to give satisfactory light to all consumers. Glasgow's ability to handle its business has been due to the fact that it has been able to purchase more than 5 per cent. of its total output from its convenient brother, the tramway department. St. Pancras has had interruptions through turbine troubles, and its supply some years ago was completely cut off for several days, owing to a general fusion of feeders which took place where several cables were laid through a single conduit.

The success of the companies in London in handling their maximum demands and daily demands is notable. In London a sudden storm or heavy fog at certain times of the year will cause darkness so great as, in a very few minutes, to more than double the amount of electricity consumed. Again, the electricity being supplied almost entirely for business purposes, a long dark day will result in a very large use of current, while a bright day will result in the use of hardly one-tenth as much. The difficulties of this situation are nevertheless satisfactorily met by the companies supplying the districts, by the maintenance of very large generating capacity compared with their daily demand, and by keeping many boilers banked, and extra engines ready to run. Voltages in both municipal and private plants are said to be generally well maintained, and with the exception of records of current in Liverpool, records and charts are well kept by all the undertakings examined. The Westminster Company records were not seen, owing to an unfortunate misunderstanding which prevented the Commission from getting detailed information from the plant.

It has been the practice in England to retain the so-called ampere-hour meter, which in reality is not a meter at all, but merely an instrument which indicates the amperes of current, and not the amount of electrical energy consumed, which is the measurement desired, and which is obtained by the use of the watt meter

that is in general use in this country. The Newcastle Supply Company alone of the undertakings examined has generally installed this up-to-date type of meter.

Complaints are generally carefully attended to, both by companies and municipalities.

It was stated by the various undertakings that street lamp outages were infrequent, especially in the City of London Company, which has maintained a wonderful record. Outage inspection in municipalities is made by the electrical undertakings, or by the police or general patrol, and in the companies is made by municipal inspectors.

In regard to locating mains, and making street line extensions, it was noticeable that municipalities were more favored than private companies. When a company wishes to locate a main it is forced to take the location allotted by the city, which may not be the one most desirable, whereas a municipality selects its own location without thought except for the welfare of its own distributing system. When a street is to be laid out or repaved, companies and municipalities alike are given an opportunity to lay or repair lines, with the understanding that if they fail to do so they will be forbidden to open the streets later on. In Liverpool and St. Pancras, however, street extensions are not generally made ahead of paving improvements, but when need arises those municipalities are able to get permission to open the streets in a way that would be impossible for a company.

The testing of meters is not given as much consideration in England as in this country. For instance, Manchester tests but once a year; Liverpool and Glasgow are very careless, and St. Pancras, though it attempts to inspect all meters once in five months, does so in a crude manner.

The companies as a rule look after their meters somewhat better than the municipalities, although with the exception of the Newcastle Supply Company, their general methods of testing are not up to the standard of American practice.

Companies on request test their meters without charge, but the consumer if dissatisfied can appeal to the local authorities. If it is then found that the meter is wrong the company pays the charges for testing; if not, the charges are paid by the consumer. Meters of municipal undertakings are tested on request by examiners appointed in accordance with statute, in various ways intended to secure an impartial examination, and charges depend on whether or not the meter is found to be correct.

II. USE.

a.—Extent of Use.

In the matter of the extent of use of electrical service the superiority of management of private companies strongly appears.

All of the municipalities, with the exception of Manchester, which has recently acquired a small area to the east which offered a profitable field for development, have confined themselves to the disposal of current entirely within their corporate limits, com-

pelling the inhabitants in the surrounding territory to remain unsupplied, or to depend upon other municipalities or companies to invade their somewhat sparsely settled districts. For instance, the unwillingness of Glasgow to supply current outside the city proper has resulted in the establishment of a private company called the Clyde Valley Electric Supply Company, that is developing this suburban territory, and in so doing is conferring material benefit on the people just outside the city limits and in the surrounding country, who would otherwise have been unsupplied. (See account by experts attached to supplementary report.)

The undertakings in London are not comparable as regards their areas of supply, as they are entirely hemmed in by other undertakings which have already occupied the surrounding territory, but the two Newcastle companies show what energy and progressiveness can do in this regard. They cover the cities of Newcastle and Gateshead and many miles of surrounding territory on a scale which none of the municipalities has attempted.

Merely to have electric service offered, even though it be offered at a low price, does not benefit a community. The benefit comes from the use of the service, and the extent of the benefit is in direct proportion to the extent of the use. For this reason the following table, showing the population in the area supplied by each of the undertakings examined, the total sales for private lighting and commercial power, and the sales per capita, is of the greatest interest and importance:

Municipalities—	*Total Population in Area Supplied.*	*Sales in K.W.H. for Private Lighting and Commercial Power.*	*Sales Per Capita in K.W.H.*	
Glasgow	760,423	16,722,963	22.0	
Liverpool	704,134	11,029,223	15.7	
Manchester	745,000	14,679,373	19.7	
St. Pancras.....	235,000	5,047,974	21.5	
Companies—				
Newcastle Supply.....	357,000	11,710,579	32.8	50
Newcastle and District..	250,000	5,183,834	20.7	
City of London.....	42,576	17,789,351	417.8	
St. James and P. M....	20,000	7,666,996	383.3	
Westminster	128,025	12,919,208	100.9	

In this table, the Glasgow, Liverpool, Manchester, St. Pancras, and the Newcastle undertakings are comparable, but it would be unfair to draw deductions from the high per capitas of the companies in the heart of London, because the residential population in their areas is so small compared to the opportunities presented for the sale of current.

The per capita sales in the area covered by the Newcastle Supply, and the Newcastle and District companies are almost equal to the sum of their individual per capitas, for the reason that, with a very small exception, the 250,000 people living in the area sup-

plied by the Newcastle and District Company are included in the 357,000 people living in the area served by the Newcastle Supply Company. The combined sales of these two companies, one of which has extended over thirty miles into the country, are therefore slightly over 50 K. W. H. for every man, woman and child living in the great and sparsely settled areas supplied by them.

Compared to the large per capita sales of the Newcastle companies, those of the municipalities investigated are extremely small. Glasgow for instance, though it serves a large population congested in a small area, where service is easily rendered and much needed, made sales of but 22 K. W. H. per capita, or less than one-half those of Newcastle. St. Pancras and Manchester with similar advantages showed even lower figures, while Liverpool's per capita sales were very low compared with those of the Newcastle companies, being only 15.7 as against 50.

St. Pancras Borough is principally residential, containing some few manufactories and a number of shops, and though its undertakings cannot therefore be fairly compared with companies operating in London's congested business district, its sales per capita, which hardly exceed those of Manchester and Glasgow, should be much higher, and show emphatically a want of business enterprise. On the other hand, though the per capita sales of the companies operating in London are not to be fairly compared with those of companies supplying residential as well as business sections, their total private lighting and commercial power sales show an ability to do business unequalled by any of the municipalities.

The City of London Company, for instance, though limited to an area of not over a square mile, makes yearly private lighting and commercial power sales, in the face of energetic competition, considerably larger than those of Glasgow with its three quarters of a million inhabitants. These enormous sales are, of course, due largely to the commercial importance of the district, but they would never have been made had it not been for the energy shown by the company in inducing use of its light and power by every manufacturer and business man for every description of possible electric service. The St. James and Pall Mall Company supplies an area in the City of Westminster, London, of approximately only 150 acres, but its total sales for the year are greater than those of St. Pancras, which covers 2,694 acres, and includes manufacturing and business districts. This fact leads again to the inevitable conclusion that the St. James, like the other companies, is doing vastly more efficient work in distributing the advantages of its service than is any of the municipalities.

The Westminster Company supplies a population of 128,000 people in a portion of the city of Westminster. Its area of supply includes the large park district of the city, but it has a private lighting and commercial power output larger than the city of Liverpool, and shows seven times its sales per capita.

The Central London Company sells current in bulk only.

The municipalities investigated all have the sole right to sell electricity in their area of supply. Manchester and Glasgow, therefore, have a monopoly , for they also operate their gas plants, and Liverpool and St. Pancras are subject to competition only from gas companies. This is not the result of accident, but of a well defined determination noticeable in almost all cities engaged in trading, to protect their ventures from the disquieting influence of competition from private companies, their object being not so much to succeed in getting for their citizens an extensive lighting service, as to succeed in showing how profitably they can do municipal trading. The companies examined, on the other hand, are subject to severe competition from both gas and electric rivals, which makes it the more remarkable that they have acquired so much more business than have the municipalities.

In Exhibit B, at the end of this chapter, are given further details of the sales made by the undertakings, showing in kilowatt hours the amount of current generated, the amount used at plant, the amount unaccounted-for, and the amounts sold for public street lighting, railways, private lighting and commercial power, the sales in bulk and the total amounts sold.

From this table it appears that, of municipalities, Liverpool and Manchester generate the largest amounts of current. This is due to their large sales to municipal tramways, which in the case of Liverpool is 48 per cent. of the total current generated, and in the case of Manchester is 39.5 per cent.

The St. James and the Westminster companies, which supply the little city of Westminster in the heart of London, together with the competing London Supply Company, which covers the same area, sell to private lighting and street lighting 33,000,000 kilowatt hours, which is more than all Liverpool's electric lighting and tramway load, as much as Manchester's electric lighting and tramway load together, twice as much as the entire lighting and commercial power load of Glasgow, two and one-half times as much as the entire electric lighting and commercial power load of Manchester, and three times as much as the entire electric lighting and power load of Liverpool.

The City of London Company sells about 19,000,000 kilowatt hours and the Charing Cross Company, in competition, about 5,000,000. This is a total of 24,000,000 kilowatt hours in the City of London, or a load one and one-half times that of all Glasgow electric department sales, 1.7 times that of all Manchester and twice that of all Liverpool.

Comparatively little street lighting is done by electricity in the cities investigated, because of the provision generally made by the municipalities for lighting their streets by gas. The number of arc lamps of each of the undertakings examined is as follows:

Municipalities—	
Manchester	94
Liverpool	193
Glasgow	825
St. Pancras	792

Companies—	
Newcastle Supply	8
Newcastle District	None
City of London	502
Westminster	956
St. James	66

Glasgow and Liverpool furnish only 825 and 193 arc lamps, respectively, while Manchester supplies but 94 arc lamps. St. Pancras does much more than the other municipal undertakings, but, in proportion to the streets available, its arc lamps are few compared with those of the City of London, St. James and Westminster companies, and such extension of its street lighting service as it has made, would be more commendable were it not for the fact that it was made in the face of offers on the part of a competing private gas company to light the streets for less than the borough could light them by electricity.

Liverpool's records as to current were deficient to a degree unheard-of in any of the private companies. For instance, no records were available to show the "Current used at works," the "Current unaccounted-for" or the "Total current produced." In fact, the only figures obtainable were those of "Total current sold." It has therefore been necessary, in working up the data per kilowatt hour generated, to calculate the amount of current produced by assuming that Liverpool's sales were 75 per cent. of the current produced.

The Manchester and Newcastle Supply Company's figures of current used at works and unaccounted-for were considerably higher than the others. In the Newcastle Supply Company this is due to the fact that their auxiliaries are all electrically driven and that all their generated current is of the A. C. type, which, being delivered to some thirty substations, involves a large transforming loss. This loss is, however, more than compensated for by economies effected in other directions by the adoption of this system.

Manchester has not the same number of electrically driven auxiliaries, and their large figure of current unaccounted-for is not explained by any data obtained by the Commission. The current unaccounted-for in St. Pancras is very small for the reason that no loss is considered in the street lighting circuits. The Central London Company has no current unaccounted-for, as their entire output is sold to the Westminster and St. James companies at the bus bar.

After considering the above information describing the extent of use of electricity in the cities investigated by the Committee, it is pertinent to show how private electrical companies in the United States have developed the electrical industry in comparison with the development of the industry shown in the United Kingdom. There is no question in the writers' minds that British laws, antagonistic to private interest in the electrical lighting and favorable to municipal ownership, have affected the development of the electrical industry, as shown by the following statistics:

	United Kingdom, 1905.	*United States*, 1903.
Total cities of 8,000 population and over	586	545
Total population of such cities	26,780,531	25,947,404
Total public arc lights in such cities	24,368	166,313
Average population per arc light	1,099	150
Number of cities having no public arc lighting	351	7
Number of cities having central lighting stations	333	545
Cities having a population of 300,000 or over	11	14
Total population of such cities	9,577,373	11,449,463
Total public arc lights in such cities	9,128	54,859
Average population per arc light	1,049	208
Number of such cities having no public arc lighting	1	None
Number of such cities having central lighting stations	11	14
Cities having a population of 100,000 to 300,000	34	25
Population of such cities	5,320,184	3,920,346
Total public arc lights in such cities	4,653	27,552
Average population per arc light	1,143	142
Number of such cities having no public arc lighting	5	None
Number of such cities having central lighting stations	32	25
Cities having population of 50,000 to 100,000	57	43
Total population of such cities	3,998,226	2,058,710
Public arc lights in such cities	4,118	13,651
Average population per arc light	971	150
Number of such cities having no public arc lighting	11	None
Number of such cities having central lighting stations	55	43
Cities having population of 25,000 to 50,000	112	94
Total population of such cities	3,838,814	3,252,371
Public arc lights in such cities	3,663	26,653
Average population per arc light	1,048	122
Number of such cities having no public arc lighting	38	None
Number of such cities having central lighting stations	94	94

	United Kingdom, 1905.	*United States,* 1903.
Cities having population of 8,000 to 25,000	372	369
Total population of such cities	4,045,934	5,266,514
Public arc lights in such cities	2,806	43,598
Average population per arc light	1,798	121
Number of such cities having no public arc lighting	296	7
Number of such cities having central lighting stations	141	362

b.—Character of Users.

The only plants investigated which sell current for tramway purposes are those of Liverpool and Manchester, and those of the Newcastle Supply and City of London companies. Sales in bulk are made to some extent by the Newcastle Supply Company, and constitute the entire business of the Central London Company.

Little sign lighting is done compared with that in the United States, but the three companies in London have been energetic in working up this branch of their business.

The Newcastle companies have undertaken to supply the demand in their district for cheap power, and to this end have installed efficient high tension plants and substations. Their inroads on the steam power business in competition with the cheap "coals of Newcastle" is the marvel of the municipal operator and the pride of the advocate of private enterprise.

The same initiative which has been at the bottom of the success of the Newcastle companies, has enabled the City of London Company to acquire much of the power business in its district, and to shut down many of the small smoky steam plants which, operated with the license of the municipal authorities, have blackened the atmosphere in the heart of London.

The policy of combining the generating plants of the lighting and street railway departments is economically advantageous, but the true costs of carrying on each enterprise should be allocated to the proper department, instead of being apportioned in a way to make one department help to pay the expenses of the other. This apparently has not been done in Liverpool and Manchester, where tramway charges respectively of 1.107d. and 1.491d. per kilowatt sold seem so high, considering that no distribution expenses are incurred, as to necessarily suggest that the tramway department is being made to bear part of the expenses of the electric department.

c.—Efforts to Extend.

The most up-to-date effort to get all possible business has been made by the Newcastle Supply Company. It has two special canvassing departments, one dealing in power and one in lighting, the business of which is done by trained canvassers, who are competent to deal with all problems, both commercial and engineering. The company also advertises by means of circular letters, monthly

pamphlets, and by various devices arranged by a special advertising department. Motors, and heating and cooking appliances are rented on easy terms on hire or hire-purchase systems. Exhibitions are periodically held and special appliances are shown under working conditions in the company's show rooms.

The other companies examined have been progressive in this regard, though to a less degree than the Newcastle Supply. The London companies state that owing to the business in their districts being confined to service to business men, it has not been necessary for them to maintain show rooms and exhibits. Instead, they have perfected contracting departments, and have gone after and have obtained a tremendous business, considering the small areas available.

Liverpool makes no effort to get new business. Glasgow employs but one canvasser, and for the rest relies entirely upon the self-interest of electrical contractors; and, generally, with the possible exception of Manchester, the municipalities have been far behind the companies in their efforts to extend their business. For this there are apparently three reasons:

(1) Because in places like Glasgow and Manchester, where the city also owns the gas works, the committees in charge of the gas works strongly object to the establishment of any electrical competition which will militate against their undertakings, and they find means to make good their objections in the Council.

(2) Because, being subject to no electric competition and no serious gas competition, the municipalities obtain the most lucrative business, and have little desire to acquire the more widely scattered and less remunerative consumers.

(3) Because in this department, as in others, municipalities have preferred to keep the profits which they are sure of rather than to venture anything to try to get profits which might not be forthcoming.

This narrow policy of the municipalities has helped them to maintain a better financial showing than would otherwise have been possible, but from the point of view of the welfare of the citizen it has been a mistake.

III. COST OF PRODUCTION.

The following table, made up from figures taken from Schedule IV., shows the Generation, Distribution, General and Total Costs, in pence, per K. W. H. generated.

Municipalities.	*Generation.*	*Distribution.*	*General.*	*Total.*
Manchester	.5001	.2530	.0877	.8408
Liverpool	.4715	.0313	.1262	.6290
Glasgow	.4969	.1697	.1497	.8163
St. Pancras.....	.8683	.2094	.2046	1.2823
Companies.				
Newcastle—Supply	.3379	*.....	.1945	.5324
Newcastle—District	.6651	.0428	.1143	.8222
London—City	.6830	.1611	.3233	1.1674
Westminster	1.3153	.1378	.3527	1.8058
St. James.....	1.2826	.2611	.3278	1.8715
Central	.7938	.0009	.1856	.9803

* Newcastle Supply Co's Distribution figures included in Generation.

It is unfortunate that, with the exception of the Newcastle companies, all of the private undertakings examined are located within the metropolitan district, in that, because of the general difference in conditions and high cost of labor and materials in the Metropolis, it would be unfair to compare London companies with those in provincial municipalities.

A comparison of the St. Pancras undertaking and the three London companies can, however, be made with allowances for certain differences of conditions. This shows that the total cost per K. W. H. generated by St. Pancras is somewhat more than that of the City of London Company, and that it is somewhat less than those of the Westminster and the St. James companies. In comparing these costs, it must be remembered that the Westminster and St. James companies purchase a large part of their electricity from the Central London Company, and therefore, have included in their operating costs not only the operating costs but the fixed charges, profits, and in fact practically the total income of that company. Allowing for this fact, any difference that there may be in favor of St. Pancras is due to some extent to the fact that the companies operate in the heart of the City, where the expense of doing business and maintaining lines is much higher than it is in the less congested area supplied by St. Pancras, and to less extent to the fact that the "General" expenses of St. Pancras are noticeably less than are those of the companies. For instance, under the Public Authorities Act of 1893, which was passed by Parliament under pressure of the Municipal Corporations Association, a person injured by a municipality in the conduct of its public services is prohibited from bringing any action against the municipality more than six months after the accident, whereas if the accident had been caused by a company's negligence, the injured person would have six years in which to bring an action. Further, an unsuccessful plaintiff in a suit against a municipality is penalized by having to pay the municipality a high scale of costs, known as Solicitor and Client Costs, which are never awarded on the same scale between other litigants. These, and similar provisions in the act, make litigation with a municipality risky and costly, and have a decided tendency to lower a municipality's damage suit expenses. The expense of getting new business is much greater in the case of the companies than it is in the case of St. Pancras, which is less progressive in this regard; also, we were not enabled to determine that all proper charges against the municipal undertakings were included in the figures given us as costs.

Eliminating the London undertakings, we have left for comparison the Newcastle Supply and Newcastle and District Companies, and the municipal undertakings of Manchester, Liverpool and Glasgow.

The total operating cost of the Newcastle and District Company is much the same as those of Glasgow and of Manchester, but is higher than that of Liverpool. The Newcastle Supply Com-

pany, on the other hand, shows a total operating cost very much lower than that of Liverpool—the lowest of the municipalities. In the year examined the Newcastle Supply Company paid one thousand and thirty pounds for legal expenses, while only two hundred and twenty-five pounds was charged against the Manchester undertaking, and no charge under this head was made against Liverpool or Glasgow. The Newcastle Supply Company paid one thousand five hundred and seventy-two pounds for insurance, while Manchester paid only one hundred and sixty pounds, Liverpool only eight hundred and twenty-four, and Glasgow nothing. The Newcastle Company, as already noted, also spent more than the municipalities in efforts to educate the people in its area to see the advantages to be derived from a large use of service. As a result of these and similar differences in management, the "General" costs of the Newcastle Supply Company were much higher than those of any of the municipalities, a fact which makes their small total operating cost the more indicative of economical and efficient management.

Liverpool's low general expenses, on the other hand, show that Liverpool trusts largely to good fortune to prosper its undertaking, and, when compared with the high general costs of the Newcastle Supply Company, are a fair indication of the difference that actually exists between the progressive alertness of the one and the careless backwardness of the other.

Of the Newcastle Supply Company it may be said, not only that it can generate electricity at an extremely low figure, but also that it knows how to spend money wisely in its efforts to give the best possible service to the greatest number of people.

An examination of the detailed costs as given by the expert accountants, shows that municipalities in England, though said to be much better governed than are those in the United States, are by no means as well adapted for commercial operation of an electric lighting plant as are private companies, controlled by men of average honesty and ability, whose training and initiative are given full scope.

IV. PLANT.

a.—Character.

Glasgow.

There are three generating stations in Glasgow; Port Dundas, St. Andrews and Kelvinside.

The Port Dundas plant is located on the Forth and Clyde Canal. The total capacity of the apparatus at present is 15,000 K. W., with a possible extension of 18,000 K. W. without increasing the building to any extent.

A part of the supply of coal is brought to the station via the canal in barges. The ashes are removed in carts. On the opposite side of the canal, about 200 yards distant, is a railroad siding from which it would be possible to receive coal by constructing a tunnel under the canal. Any coal now received by rail is hauled a considerable distance in carts.

The canal barely provides water for condensing purposes without undue heating, and should the canal traffic fall off to a material extent, it is doubtful whether there would be sufficient water to serve the station when its capacity is entirely developed.

The first section of Port Dundas Station was laid out in 1898 for the generation and distribution of direct current, 500-250 volts, by the three wire system, for which purpose it was fairly well located, being within a mile of the centre of that part of the city north of the Clyde.

St. Andrew's Cross Station is located south of the Clyde about three-quarters of a mile from the river, and extends back to a railway by which coal is obtained. The railway is on low level, which necessitates lifting the coal cars by elevators to a trestle over the boiler room and coal stores. The ashes are removed by carts. There is no sufficient body of water near by for condensing purposes, so that large shallow tanks containing cooling towers have been erected over the boilers, which enables part of the machinery to run condensing. The water supply for this apparatus and for the boilers is received from the city mains. When the station is fully developed, with the turbines which are now being installed, it will be impossible to operate all of the apparatus, condensing with cooling towers. The station supplies direct current, 500-250 volts, on a three-wire system; it is well located for distribution purposes, being practically in the centre of the district south of the Clyde, but is poorly located for economical generation.

The small Kelvinside plant is located in the northwestern part of the city. It is useful only for distributing current to the district at commercial pressures, but is inefficient for the purpose of generating.

Glasgow's distributing system consists mainly of the three-conductor concentric type of cable, supplying direct current at 480 and 240 volts. This type necessitates elaborate service connections and the adoption of many special devices that are both expensive and troublesome. Most of these low tension concentric cables are laid solid in the earth, which means that they are lead sheathed, and are non-reclaimable except at great cost.

The supply of the city by the extension of the direct current system has necessitated an amount of copper much in excess of what good modern practice requires. High tension apparatus and substations should have been started some years ago, which would have enabled the city to maintain a 110 volt system without this great expense for copper.

The city is making a mistake in installing turbines at the St. Andrews Cross station to generate direct current for the three-wire system, for the reason that the station, as described above, has no water for condensing purposes, and depends on cooling towers.

A company with due foresight for best and most economical results in the future, would abandon the St. Andrews Cross station, and would erect a new plant on tidewater with railroad facilities.

Liverpool.

The Liverpool electric system is complicated and inefficient. There are two main generating plants and ten smaller stations, containing in all about eighty-three direct connected units. Five of these stations are equipped with engines which receive the steam from city destructors.

The Pumpfield station, which was built about eight years ago, is located in the heart of the city on a side slip of the Leeds and Liverpool canal. This station has no railroad siding and is not within short hauling distance. Coal is received by barge from the canal. The canal is a dead-end, and its use for condensing purposes is limited because of undue heating of the water, which is objected to by the shipping interests. During the time of full load, therefore, one-half of the station is compelled to run non-condensing. The station is centrally located for the distribution of direct current—500-250 volts—which is the only kind produced, but is very poorly located for economical generation. Advantages of location for generation and distribution could have been readily combined in one site.

The Lister Drive station is very disadvantageously located about three miles from the centre of the town, one of the reasons suggested for having selected the site being that the property already belonged to the municipality. It occupies a large area, and the buildings are arranged, without regard to economy in the utilization of space, in such a way as to make extensions impossible. It has railroad connections, but has no body of water adjacent that can be utilized for condensing purposes, a fact which has necessitated the installation of cooling towers, the water for which is obtained from the city mains.

The first section at Lister Drive is similar in design to the Pumpfield station. The buildings of the second section are of the same design, but the installation is steam turbo generators. One-half of the building only has been occupied, while the other half, built at great expense, has now lain idle for some time.

In these three stations, the division of boiler room into practically four separate sections, is a notable engineering mistake in that it necessitates a duplication of labor and tends to lower the general efficiency of the plants. In fact, the general design and location of these three plants is diametrically opposed to what the best modern practice has proved to be most economical and efficient.

A large part of the current produced at Lister Drive is direct 500-250 volts for the three-wire system. To transmit this current three miles to the centre of the city requires 18 square inches of copper and especially constructed conduits. This is an absurd system, in that it is extravagantly expensive to lay; it makes the recovery of the copper, when a change is desired, extremely difficult; it involves a heavy line loss; it does not supply consumers with the current best suited to their needs, and at the time it was installed, it was well known to the electrical world that high ten-

sion current, with substations, was vastly cheaper and more efficient. Some of the current is produced by two 1,700 K. W. units and four turbines of the three-phase type A. C. generating at 6,000 volts. This current is transmitted to substations, where it is transformed to direct current for general consumption or for railway service.

There are five smaller steam generating stations owned by the undertaking that have from five to ten steam units, each averaging about 150 K. W. These plants are scattered throughout the city, and all of them receive their coal by carts, and in the same way dispose of their ashes. They are run non-condensing, and obtain their water from the city mains. They supply direct current and couple on to the undertaking's feeders wherever located. Four of these steam stations are also equipped as substations.

In addition, there are five small stations with from three to four steam driven units, each generating direct current. These stations are built in conjunction with garbage destructors, established by the city, in which the garbage is burned under boilers generating steam, for the use of which the electric department pays the city. Inasmuch as these garbage destructors must be operated without interruption, the electric undertaking is forced to dispose of this current, which is costing them more than they can generate it for at the larger stations, at the same time shutting down the larger stations to accommodate the load.

The Liverpool situation is the worst of the undertakings investigated. Poor judgment has been exhibited in the selection of station sites, in the adoption of uneconomical units, in the continuance of small individual steam stations, in the adoption of the destructor as a steam generator, in the putting of an enormous amount of money in underground copper—which is practically not recoverable except at great expense—and in the failure to install the modern alternating system.

Some day Liverpool must pay for its engineering mistake, its crime against economy. In view of the present state of the art, the Liverpool plant is mainly scrap, as, indeed, a large part of it was when put into operation.

Manchester.

The Manchester electric undertaking has three steam generating stations, the Dickinson street and the Bloom street stations in the heart of the city, and the Stuart street station in the outskirts, some three miles from the commercial district.

The Dickinson street station belongs to a type in vogue about 12 years ago, with some modern apparatus crowded in, while the Bloom street plant is about six years old in both design and equipment. These stations are not located within short hauling distance of a railroad, but are on an arm of the canal by which they receive coal. The coal storage is small and the method of handling coal is poor. The real estate available is now entirely occupied. The canal affords transportation facilities, but though used originally to some extent for condensing purposes, such use is now practically forbidden, so that the stations are compelled to run non-condensing.

The Stuart street plant, three miles from the heart of the city, is the largest and newest of the stations. At a time when there was ample opportunity to select a favorable situation on the river, with railroad facilities, without going any further afield, the city very unwisely selected a location, on a canal which is too small for condensing purposes and which, though capable of supplying coal, can do so only at a higher cost than by rail. A further drawback to the site selected, is that it was not within a mile of any railroad, a fact which has necessitated the construction by the municipality of an elevated railway extension of over a mile in length, at a cost of nearly £80,000. The location could hardly be worse.

The layout at this plant, as first planned, was good though expensive. It was later extended in a most extravagant manner, and changes were made which interfered with the first plans for economical use and development, and which necessitated a rearrangement at great cost of the elevated railway, and elaborate ash and coal handling devices. Cooling towers, provided with forced draught to give capacity large enough to handle the installation, have now been erected. The type of current generated is the three-phase alternating current of 6,600 volts.

All in all, the Stuart street station is the most expensive, for the capacity installed, that was inspected by the Commission.

Manchester has about nineteen sub-stations equipped with motor driven generators and balancers, which are principally used for the tramway service. These are scattered all over the city and in the outlying districts, some being constructed underground in the thoroughfares.

The Manchester distributing system is the most extravagant and complicated of those examined. There is still some copper strip which is the cause of a great deal of trouble through short-circuiting, and a large part of the heart of the city is covered with the antiquated five, four and two-wire systems. Again, the feeders, on leaving the Stuart street station, run through a very large, costly and unnecessary tunnel three-quarters of a mile long.

By earlier installing high tension sub-stations and adequately designed distributing systems, Manchester could have maintained a 110-volt lighting system for commercial purposes, with the same amount of copper that they have for the less efficient system now in use.

St. Pancras.

St. Pancras has two generating stations. The more modern station at King's Road has no railroad siding and is forced to haul its coal by means of carts from the Regent's canal. Canal water is used for condensing purposes. There is a destructor near this station, which is operated with the same unfortunate results as in Liverpool. This station was originally designed to generate direct current intended to supply the immediate neighborhood. Two alternating current units have since been installed transmitting current to sub-stations in various sections of the borough. One

turbine unit of the twin-generator direct-current type has recently been added. It was undoubtedly a mistake not to have put in an alternating-current, instead of a direct-current turbine. This has already given considerable trouble, and is so noisy as to compel the undertaking to brick up all windows in the front of the station.

The older station is situated near Regent's Park. It is in a poor location in that it has no condensing water or railroad sidings. All coal and ashes have to be carted. Its station equipment consists of 12 boilers of small capacity and many small, old type generating units. For instance, it has ten 80 K. W. and four 500 K. W. machines. Its supply system is 440-220 volts three-wire, but it has still a few customers who assert their right to remain on the 110 volts system, and it is, therefore, compelled to run a 50 K. W. motor generator for these few customers.

The records of the St. Pancras undertaking were so poor that it was impossible to obtain data as to the amount of underground cable in use, but it is known that a considerable quantity of bare copper strip still remains.

Newcastle-Upon-Tyne Electric Supply Co.

The Newcastle Supply Company has two generating plants, one—the Neptune Bank station—acquired in 1902 by the purchase from the Walden and Wallsend Union Gas Company, and the other—the Carville station—built by themselves. The location of these stations is at the extreme eastern end of the city—the Carville station being just outside the city limits.

The Carville station is located on the bank of the Tyne, on a plot of about fifteen acres extending back to high level railway sidings. This station is far the best, cheapest and most economically designed station visited by the Commission. When examined, it had a capacity of 12,000 K. W., and an addition of 15,000 K. W. was being made. These units are of the Parsons type of 4,000 K. W. and 5,000 K. W. capacity. All current generated is alternating of 6,000 volts potential, and is transmitted to eleven substations owned by the company, and to some thirty other substations owned in whole, or in part, by various companies or individual consumers.

In addition to the two generating stations mentioned above, the Newcastle Supply Company controls the Priestman Power Company. This is a unique undertaking in that the boilers and turbines are adjacent to a coke oven plant, the waste gases of which it utilizes as boiler fuel.

The company is now laying conduits to Durham, 32 miles distant, where they intend to send current under 22,000 volts potential.

The Newcastle Electric Supply Company is the most progressive and up-to-date electric undertaking that was encountered in England. Their new station is most efficient, and they generate current cheaper than any other undertaking. They have large units, run condensing, and handle the coal and ashes with the least possible expense and time. Their plant is designed so as to be

readily extended to 75,000 K. W. They have ample workshops and do all of their own repair and construction work.

The Newcastle and District Company.

The Newcastle and District Company theoretically operates in opposition to the Newcastle Supply Company, both having rights in Newcastle city proper; but they have agreed not to conflict, and have practically divided the territory.

The District company has three stations. The oldest one, which is at Forth Bank, has been in existence some 15 years. It is equipped with turbines, and contains the first turbines ever built by Parsons.

The Close power station on the bank of the Tyne was built in 1902 and has also adopted Parsons turbines. It has about 12,000 K. W. installed, generating direct current on the three-wire system at 480-240 volts. This station is on the bank of the river, is run condensing, and receives its coal by cart from the collieries or from barges on the river.

The company has another station at Newburn, or Leamington, about four miles west of the city, substantially built and located on the bank of the Tyne, where condensing water is available. Coal is at present received by boat and handled by steam cranes. Provision has been made for the installation of a high level railway siding when necessary. The equipment of this station is of steam turbines of the twin D. C. type, generating 440 volts. The station was built to supply the territory directly west of the city. This station and the Close station are well built and economical D. C. stations, but are not as satisfactory or efficient as they would have been if equipped with high tension alternating current units and sub-stations similar to those installed by the Newcastle Supply Company.

The distributing system of the District company is in excellent shape. The records are good and show in detail the underground installation. The company has a large storage battery in the heart of the city to take up fluctuations on the lighting load. It still furnishes some single-phase alternating current generated by the turbines put in by Parsons some fifteen years ago.

London Companies.

The electric situation in the metropolitan area of London has been in a chaotic condition, owing to the possibility of the London County Council, or some large central supply company taking over the generating business of the entire area. As a result of this threat, the undertakings have not been warranted in abandoning their old stations for the construction of new central ones. In the meantime, the old stations are badly located, and the whole electric art in London shows a want of proper progress.

City of London Electric Company.

The power house of the City of London Electric Company is the best located for the generation and delivery of direct current of any of the plants investigated in London, being built on the Thames, where it can utilize the river for condensing purposes

and for receipt of coal. The space available is very small, but by skillful arrangement the company has been able to install a capacity of 43,000 h. p. in engines, operating 22,000 K. W. generators.

The company supplies direct current on the three-wire system at 450-225 volts. It also generates a small amount of alternating current at 2,300 volts.

All material is handled by labor-saving devices, and the units installed are so large as to permit of the least amount of supervising labor.

The company's distributing system is laid in every street and lane in its area, requiring immense quantities of copper. It has many small balancing stations and several sub-stations.

The St. James and Pall Mall Electric Light Company.

The St. James and Pall Mall Electric Light Company is situated in the parish of St. James in the city of Westminster, in which city the advantages of railway sidings and water for condensing purposes are not to be had. An old generating station at Mason's Yard is now practically out of commission and is used for a substation. At the Carnaby street station where all coal and ashes have to be carted, the company is generating economically, and supplying current for comparatively low rates. This station, which has now about 1,500 K. W. in motor generators in place, will eventually be entirely used as a sub-station. The company has seen the necessity for a central supply company, so, with the Westminster company, it has formed the London Central Supply Company, and has built the first unit of a large central station at Grove Road, St. Johns Woods. In the future all additional generating capacity will be installed at this plant, and, as the occasion warrants, generating units at Carnaby street will be displaced by motor generators.

The distributing system of the St. James company is the only one of all the undertakings examined that is the 240-120 volts, three-wire system. In common with Newcastle, it gives its consumers the advantage of being able to use the 3.1 watt lamp so commonly in use in the United States, and the higher-efficiency filament lamps now coming into use. None of the municipalities offers this economy to its customers.

The Westminster Electric Company.

The Westminster Electric Company supplies a residential and business section in the city of Westminster. It has three stations of a type installed some 12 or 15 years ago.

The first station receives its coal from barges and utilizes the Thames river for condensing purposes. The second receives its coal by wagon and utilizes the Thames river for condensing purposes by pumping the water through a long underground main. The third station is located in such a position as to get no condensing water and is forced to haul its coal and ashes. These stations were thus located owing to the character of current produced, and the character of distribution, at the time of their installation. A few years ago the company, as mentioned above, com-

bined with the St. James company to build a central supply company, with the idea of gradually shutting down its generating plants and installing sub-stations. The units now in operation at the three stations are small direct-current units furnishing 400-200 volts on the three-wire system. The stations are well located for this service and hence will be well placed for sub-stations. Considering the conditions under which the company is necessarily working it is generating efficiently and cheaply.

Its distributing system is well laid out, and it is adopting, after thorough investigation, the paper conduit draw-in system which it has found to be cheap, and which enables it to replace its mains and recover the copper with comparative ease.

About 1905 the company built a most elaborate sub-station at Duke street in the heart of the finest residential section of London.

From the facts presented in the foregoing pages, it appears that, so far as costs and prices charged are concerned, the system of municipal ownership and operation of electric undertakings in Great Britain has not justified the claims of its advocates; so far as extending the benefits of electric light and power, and so far as progressiveness in developing the industry are concerned, this system is entirely outclassed by the system of private operation.

The financial results are discussed in Chapter VII.

EXHIBIT A.

	Private Lighting.			*Private Power.*			*Street Lighting.*		
		Receipts.			*Receipts.*			*Receipts.*	
	K.W.H.	£	*Per K.W.H.*	*K.W.H.*	£	*Per K.W.H.*	*K.W.H.*	£	*Per K.W.H.*
Municipalities.									
Glasgow [1]	12,016,934	149,917	2.994	4,706,029	25,005	1.275	1,525,505	11,450	1.802
Liverpool	8,692,187	.....	....	2,337,036	145,785	3.394	283,479	2,363	2.000
Manchester	9,939,381	159,300	3.847	4,739,992	23,260	1.178	81,032	676	2.002
St. Pancras [2]	5,047,974	.....	....	.....	59,998	2.852	1,607,800	10,049	1.500
Companies.									
Newcastle—Supply [3]	2,551,713	.....	....	9,158,866	.....	....	155,703	.....	....
Newcastle—District	1,878,936	.....	....	3,304,898	32,570	1.508	None.	.....	....
City of London	17,789,351	.....	....	.....	*227,798	2.789	1,355,384	12,989	2.300
St. James	7,666,996	.....	....	.....	109,830	3.438	148,549	1,867	3.016
Westminster	10,699,294	.....	....	2,219,914	208,345	3.870	1,979,962	16,624	2.015
Central London	None.	.....	....	None.	.....	....	None.	.....	....

*Includes Private Lighting and Power, and Railway.

	Railway.			*Bulk.*			*Total Sales.*			
		Receipts.			*Receipts.*			*Receipts.*		
	K.W.H.	£	*Per K.W.H.*	*K.W.H.*	£	*Per K.W.H.*	*K.W.H.*	£	*Per K.W.H.*	*Average Receipts Per K.W.H.*
Municipalities.										
Glasgow [1]	None.	.....	....	None.	.....	....	18,248,468	186,372	2.451	
Liverpool	20,139,621	92,876	1.107	None.	.....	....	31,452,323	241,024	1.839	2.128
Manchester	18,926,305	117,590	1.491	None.	.....	....	33,686,710	300,826	2.143	
St. Pancras [2]	None.	.....	....	None.	.....	....	6,655,744	70,047	2.526	
Companies.										
Newcastle—Supply [3]	12,307,691	.....	....	6,204,879	.....	....	30,378,852	122,438	.967	
Newcastle—District	None.	.....	....	None.	.....	....	5,183,834	32,570	1.508	
City of London	1,812,913	.....	....	None.	.....	....	20,957,648	240,787	2.757	2.219
St. James	None.	.....	....	None.	.....	....	7,815,545	111,697	3.430	
Westminster	None.	.....	....	None.	.....	....	14,899,170	224,969	3.624	
Central London	None.	.....	....	7,102,960	52,595	1.777	7,102,960	52,595	1.777 †	

† NOTE.—This amount not included in average receipts, as same current is resold by St. James and Westminster Companies.

For notes referred to by numerals, see opposite page.

Notes to Exhibit A.

[1] *Glasgow.*

	Sold to private customers		
3,743,827	units @ 6d.		£93,596
1,829,078	" @ 3½d.		26,674
146,542	" @ 3d.		1,832
664	" @ 2d.		5
3,830,332	" @ 1½d.		23,939
5,742,660	" @ 1d.		23,928
1,349,150	" @ ½d.		4,216
16,642,253	"		£174,190
80,710	units sold unmetered		782
16,722,963	"		174,922
1,525,505	" for street lighting.		
18,248,468	"		

[2] *St. Pancras.*

	Sold to private customers	
848,799	units @ 6d.	£21,220
830	" @ 5d.	17
1,141,984	" @ 4d.	19,033
364,535	" @ 3d.	4,557
286,219	" @ 2d.	2,385
1,316,759	" @ 1½d.	8,230
1,088,848	" @ 1d.	4,537
	Premium charges	19
5,047,974	"	£59,998
1,607,800	" for street lighting.	
6,655,774	"	

[3] *Newcastle—Supply.*

	Total current sold	
18,949,923	units at less than ½d.	
7,046,844	" " ½d. or more, but less than 1d.	
6,582,891	" " 1d. " " " " " 1½d.	
883,518	" " 1½d. " " " " " 2d.	
234,258	" " 2d. " " " " " 3d.	
1,731,418	" " 3d. " " (includes street lighting).	
30,378,852		

EXHIBIT B.

Accounting of K. W. Hours Generated.

Municipalities.	*Generated and Purchased.*	*Unaccounted For.* Total.	% of Generated.	*Used at Plant, Office & Manufacturing.* Total.	% of Generated.	*Sold.* Total	% of Generated.
Glasgow	21,584,088	2,310,104	11.4	1,025,516	4.6	18,248,468	84.0
Liverpool (estimated)	41,936,300	.....	....	Not given.	...	31,452,323	....
Manchester	47,170,721	10,191,169	21.3	3,292,842	6.5	33,686,710	72.2
St. Pancras.....	8,025,553	991,442	12.4	378,337	4.7	6,655,774	82.9
Companies.							
Newcastle—Supply...	40,972,807	6,728,647	16.4	3,865,308	9.4	30,378,852	74.2
Newcastle—District..	6,513,904	1,193,981	18.3	136,089	2.1	5,183,834	....
City of London.....	23,121,642	1,463,543	6.3	700,451	3.0	20,957,648	90.7
St. James & P. M....	9,039,477	1,061,895	11.8	162,037	1.8	7,815,545	86.4
Westminster	.....	.....	....	178,692	...	14,899,170	....
Central London.....	7,102,960 (All sold at Bus. Bar.)....			.....	...	7,102,960	100.0

Sub-Division Sales.

Municipalities.	*Private Lighting.* Total.	%	*Private Power.* Total.	%	*Street Lighting.* Total.	%	*Railway.* Total.	%	*Bulk.* Total.	%	*Total.* Total.	%
Glasgow	12,016,934	65.8	4,706,029	25.8	1,525,505	8.4	None.	....	.....	....	18,248,468	100.0
Liverpool	8,692,187	27.6	2,337,036	7.4	283,479	.9	20,139,621	64.1	.....	....	31,452,323	100.0
Manchester	9,939,381	29.5	4,739,992	14.1	81,032	.2	18,926,305	56.2	.....	....	33,686,710	100.0
St. Pancras.....	5,047,974	75.8	.....	....	1,607,800	24.2	None.	....	.....	....	6,655,744	100.0
Companies.												
Newcastle—Supply	2,551,713	8.4	9,158,866	30.2	155,703	.5	12,307,691	40.5	6,204,879	20.4	30,378,852	100.0
Newcastle—Dist...	1,878,936	36.2	3,304,898	63.8	.....	....	None.	....	.....	....	5,183,829	100.0
City of London...	17,789,351	84.9	.....	....	1,355,884	6.5	1,812,913	8.6	.....	....	20,957,648	100.0
St. James & P. M..	7,666,996	98.1	.....	....	148,549	1.9	None.	....	.....	....	7,815,545	100.0
Westminster	10,690,294	71.8	2,219,914	14.9	1,979,962	13.3	None.	....	.....	....	14,899,170	100.0
Central London...	.....	....	.....	....	.....	....	.....	....	7,102,960	100.0	7,102,960	100.0

For Exhibit B continued, see opposite page.

EXHIBIT B—Continued.

Municipalities.	Population Area of Supply.	K. W. Hours Sold. Private Lighting. Total.	Private Lighting. Per Capita.	Private Power. Total.	Private Power. Per Capita.	Street Lighting. Total.	Street Lighting. Per Capita.	Railway. Total.	Railway. Per Capita.	Bulk. Total.	Bulk. Per Capita.	Total. Total.	Total. Per Capita.
Glasgow	760,423	12,016,934	15.8	4,706,029	6.2	1,525,505	2.0	None.	...	.....	...	18,248,468	24.0
Liverpool	704,134	8,692,187	12.4	2,337,036	3.3	283,479	.4	20,139,621	28.6	None.	...	31,452,323	44.7
Manchester	745,000	9,939,381	13.3	4,739,992	6.4	81,032	.1	18,926,305	25.4	None.	...	33,686,710	45.2
St. Pancras.....	235,000	*5,047,974	21.5			1,607,800	6.8	None.	...	None.	...	6,655,774	28.3
Companies.													
Newcastle—Supply.	357,000	2,551,713	7.1	9,158,866	25.7	155,703	.4	12,307,691	34.5	6,204,879	17.4	30,378,852	85.1
Newcastle Dist....	250,000	1,878,936	7.5	3,304,898	13.2	None.	...	None.	...	None.	...	5,183,834	20.7
City of London...	42,576	*17,789,351	417.8			1,355,384	31.8	1,812,913	42.6	None.	...	20,957,648	492.2
St. James & P. M..	20,000	*7,666,996	383.3			148,549	7.5	None.	...	None.	...	7,815,545	390.8
Westminster	128,025	10,699,294	83.6	2,219,914	17.3	1,979,962	15.5	None.	...	None.	...	14,899,170	116.4
Central London....	.....	None.	....	None.	....	None.	...	None.	...	7,102,960	...	7,102,960	....

* Private lighting sales include private power.

Municipalities.	Sales Per Capita. Private Lighting and Power.	Private Lighting, Power and Street Lighting.	Private Lighting, Power and Railway.	Private Lighting, Power, Street Lighting and Railway.	Sales Commercial Light and Power, Street Lighting—In Same Territory. Other Companies.	Total.	Per Capita.
Glasgow	22.0	24.0	22.0	24.0	.....	.....	.....
Liverpool	15.7	16.1	44.3	44.7	.....	.....	.....
Manchester	19.7	19.8	45.1	45.2	.....	.....	.....
St. Pancras	21.5	28.3	21.5	28.3	.....	.....	.....
Companies.							
Newcastle—Supply	32.8	33.2	56.0	67.7	.....	.....	.....
Newcastle Dist.....	20.7	20.7	20.7	20.7	.....	.....	.....
City of London....	417.8	449.6	460.4	492.2	5,281,169	24,425,804	574.0
St. James & P. M..	383.3	390.8	383.3	390.8	10,531,785	33,246,500	225.0
Westminster	100.9	116.4	100.9	116.4	.....	.....	.....
Central London ...	.....	.....	.....	.....	.....	.....	.....

CHAPTER IV.

AMERICAN GAS UNDERTAKINGS.

As we study the results of our investigation of gas works in the United States, it becomes evident that this subject does not require treatment in as much detail as did the investigation of British gas undertakings. But three American gas plants, two operated by companies and one by the municipality, were examined by the Committees and experts. In addition, the Committee of Twenty-one visited the Philadelphia gas works, and the labor investigators visited the Richmond, Va., gas works. Our financial experts were not permitted to examine the books of the Richmond gas undertaking, nor were they given any facts and figures bearing on the financial results at Richmond; nor were our engineers permitted an opportunity to appraise the plant. Therefore we are not able to say whether or not the operation of the Richmond gas plant has been financially profitable to the city. The undertakings examined by the engineering experts were Wheeling, W. Va., conducted by the municipality, and Atlanta, Ga., and Norfolk, Va., each conducted by a private company.

The differences between the two systems, in character of works and service, and in efficiency of operation, of the British undertakings, require some analysis and explanation for their proper understanding; but these are so glaring in the American undertakings as to need little more than the statement of the data, to be comprehended by the lay mind.

I. SERVICE.

a.—Price to Consumer.

At Wheeling the price of gas is $1.00 per thousand, with a discount for prompt payment of 25c., making 75c. net. At Atlanta the price of gas is $1.10 per thousand, with a discount of 10c. for prompt payment, making $1.00 net. At Norfolk the net price is $1.00 per thousand.

In considering the cost to the consumer, a charge for installing service, or for setting meters, etc., if such is made, should be included. At Wheeling the consumer is charged for the service pipe from the curb to the meter, and for the setting of the meter.

At Atlanta services are installed free, and meters are set and connected at the cost of the gas company. At Norfolk, meter setting is free, but the service from curb to meter is charged at 10c. per foot, plus repaving. This charge is, however, waived if the consumer has bought a gas range, as most of them do.

Each of the companies does gratuitous work on consumers' fittings, and, by selling incandescent gas burners and supplies, and by looking after the burners when installed, educates its consumers in the economical and satisfactory use of gas. In Wheeling nothing of this nature is done for consumers. The social advantage of this character of service is even more important to the consumer than is the financial advantage, and is all to the credit of the companies.

If we consider together, the price the Wheeling consumer pays for gas and the character of service rendered, we may not doubt that he gets less useful results per dollar expended than does the gas consumer in Atlanta or Norfolk. Add the cost of his service pipe, meter setting, and the intelligent attention to his burners and fixtures, that is a part of the gratuitous work done by the companies, to his loss due to having no intelligent source of advice in the application of gas to his various purposes (the latter by far the most important item) and we may, and do, assert that we have a disadvantage that offsets 25c. per 1,000 cubic feet difference in price.

Low and varying pressure, uncertain candle power, influenced at times by a dash of natural gas, will bring troubles to studying children that, while not factors in financial calculations, have a proper place in this inquiry. Wheeling's gas plant is not an important positive factor in the well being of Wheeling's citizens.

b.—Character of Supply.

The engineers' reply to question H-128, "Is the plant adequately equipped to handle the business?" shows that so far as manufacturing capacity is concerned, the City of Wheeling's plant is inadequate for the present business, and there is no provision for increase. At Atlanta everything is adequate for present demands, while at Norfolk the holder capacity is smaller than generally considered wise.

At Wheeling, it is to be noted that about 5,000,000 cubic feet of natural gas was purchased and used to help out the manufacturing plant, at the period of maximum consumption. It is evident from the figures that the manufacturing capacity of this plant is insufficient to provide for the maximum day. The daily manufacturing capacity is given as 590,000 cubic feet; the maximum day is 727,000 cubic feet. Wheeling's maximum day was determined or controlled by the total manufacturing capacity of the plant and not the reverse, as should be the case. The inadequacy of this plant is evident. It is indeed fortunate that they had the supply of natural gas to help them out.

A second point of utmost importance to the consumer is the candle power of the gas delivered. On this point it is almost impossible to make a satisfactory comparison, because the candle power of the gas at Wheeling is not known. There is at this municipal plant no bar-photometer, and no determinations of the candle power are made. The engineers report that the coal gas is unenriched, and it is probably at times very poor. Especially must the candle power be low when natural gas is mixed with the artificial gas, and it is to be noted that this practice is resorted to at the time of maximum consumption, when the citizens are most in need of light. At the two plants operated by the companies, a mixed coal-and water gas is distributed, regular readings on bar photometers are made and recorded, and the report says that at each plant the gas is of good quality. On this point of candle power, the comparison shows the municipal plant at Wheeling in a bad light. The experts do not report the candle power as observed by them.

the name of the officer making them, instead of classifying them by locations or in some other suitable form. By personal observation of one of the Commission's experts, an entire arc lighting circuit, on one occasion, was found to be out from 10:25 to 10:38 P. M., and on examination no record of such outage could be found.

Such carelessness is unavoidable where the city is both operating its plant and overseeing its own work. A policeman gets little praise for telling the city that its lights have gone out as a result of not having been carefully trimmed. If he does notify the electric department of an outage, and is told that the fact is known, his responsibility is ended, and he is less likely to trouble himself again; whereas were a private company supplying the light, he could get credit for zeal and good public service by following up the company until the outages were lighted. It is, on a small scale, the old inherent difficulty that is found throughout the system of municipal operation. If a municipality gives bad service, it must be put up with until a new election, and longer if hundreds of busy men do not drop useful work, and devote tremendous energy to turning out the city's officials, whereas if a company gives bad service, there can be an especial state or municipal body always ready to see that the company mends its ways, and without delay gives the people the service to which they are entitled.

Detroit's outage problem is much better taken care of than is that of the other cities. Three patrolmen, each supplied with a horse and buggy, drive over the circuits and report by telephone to the station every half hour.

The effects of another inherent difficulty of municipal ownership are apparent in these municipal plants. A private company which could not extend its lines beyond the artificial boundaries of the city or town in which its generating station is located, would be a curiosity, but of the four municipal plants spoken of in this chapter, only one can supply current outside of its corporate limits, and that one—Detroit—can only do so to parks owned by the city. The disadvantages of this restriction are particularly noticeable in South Norwalk, where certain people just outside the town limits have had to lay their own lines up to the city limits so as to be eligible for current from the city's plant.

Allegheny and Chicago are obliged by law to advertise their contracts and to let them to the lowest responsible bidder. This is perhaps a necessary precaution to save the people from the letting of contracts at extortionate rates. The method employed by private companies, which permits contracts to be made without notoriety, and consequently with many opportunities for saving, is undoubtedly more rational.

Allegheny and South Norwalk have no underground service, and the lines in Chicago and Detroit are but partially underground.

Records of the plants' operation are noticeably badly kept. For instance, none of the plants examined meter the service to their public buildings. In Allegheny, no data are available to show the

number of poles owned by the city, or the length of street served, and Chicago has no record of the length of street served, and its records in all respects are deficient in method and detail.

South Norwalk meter tests are not made at regular intervals, and indeed are never made except where complaint is entered, or where large monthly variations indicate that there must be some error, or where meters are so located as to cause special liability to damage.

No engineering tests or experiments were being carried on at the time of the investigation, at any one of the four plants, which shows that the municipalities either expect no advancement in the electrical art, or are willing to wait until the road of progress is marked out by private companies.

II. USE.

a.—Extent of Use.

The closely built-up area of South Norwalk is fairly well supplied with facilities for electric street lighting and incandescent service, but the rest of the town is not considered sufficiently promising as yet to warrant extensions of lines. Out of a total of 17¾ miles of street, only 10 or 12 are given the advantages of service. Answers to question H 101, Schedule III., indicate that extensions were made promptly when station capacity was available.

Detroit has not been progressive in extending its street lighting service. When a request is made for new service, the Lighting Commission examines the advisability of the plan, and if its superintendent reports favorably, if funds are available, and if there is capacity in the station, the extension is made. Sometimes a number of petitions accumulates and then a number of lamps is installed simultaneously.

The area of the city of Allegheny is fixed by the river on three sides and a chain of hills on the fourth. As practically every street was supplied by the plant as originally laid out, and as only a few new streets have been opened in the ten years since then, the number of street lights has been increased by only 20 per cent.

In Chicago the street lighting was undertaken by the city almost twenty years ago, thus allowing plenty of time for the department to have shown its capacity adequately to light the streets. The responsible authority not only has not shown this ability, but has eveidently not been willing to spend the taxpayers' money for extension, perhaps because of realizing the losing character of the venture. Although the city electrician has stated that there is need of some 28,000 arc lights, the city had, up to January 1, 1906, installed but 6,706 arcs, and was still lighting the rest of its great area by means of 24,000 gas lamps and 5,000 gasolene lamps supplied by private companies.

Chicago, Detroit and Allegheny are subject to no competition, as they do only street lighting, and though the manager of the South Norwalk plant says that they are subject to competition from a private lighting company, the price which they are able

A third point of importance to the consumer is the pressure of the gas maintained in his house. At Wheeling there is no recording gauge, and no record of the pressure has been kept. At Atlanta four recording gauges are on the system, continuously operating, and pressurees are taken at many point at the time of maximum demand. At Norfolk pressures are continuously taken by a recording gauge, and the charts are kept on file. At Wheeling the engineers report numerous complaints as to pressure from the southern portions of the city and the Island. There are consumers who cannot get sufficient gas until others have turned out their lights. No complaint records are kept. At Atlanta there are three points at the extreme ends of the district, where the pressure was somewhat low, but every consumer can get fair service at all times. Some mains have already been laid and others are planned to increase the pressure at these low points. At Norfolk the pressures maintained are apparently very good. There was no regular system of taking pressures all over the district, as in Atlanta, but in Norfolk, as well as in Atlanta, any complaints of low pressure in a district were followed by the proper remedy, which was applied as quickly as possible, while in Wheeling, although there were stated to be two well-defined areas of low pressure of long standing, no examination had been made to determine exactly what caused the trouble and how it could be remedied, nor had anything been done to remedy it.

On the question of attention to complaints and other orders from consumers, it is evident that the consumers at Wheeling are not well served. As already stated, no record of the complaints is kept. In answer to question H-136, the engineers state the complaints seem to be promptly attended to, but there are many repeated complaints from the same house, so the efficiency is not good. From the description given, there is no attempt made at Wheeling to check up the fitters who go out on complaints, so that if these men neglect their work or lose complaint orders, no one in the office would discover it. Wheeling maintains no record of the work done by these mechanics. The Wheeling meter prover leaked badly, and no proper test was possible. A leaking prover tends to make a fast meter appear correct. How much of Wheeling's low price is offset by fast meters, no one knows, but it must be considerable, if Wheeling follows the common and correct practice of testing meters before setting.

What, with fast meters, charges for services and meter setting, absence of any gratuitous work, the admixture of 15 cent, 8-candle power natural gas, insufficient and irregular pressure, and general inefficiency in the complaint department, Wheeling gas is a dear commodity at any price. Our experts found nothing to praise in Wheeling's service and little to criticise in the service of the companies at Norfolk and Atlanta.

II. USE.

In considering the degree to which gas is used by the inhabitants of these cities, one is confronted at once with several condi-

tions which affect the comparison; for example, in the case of Wheeling, the presence of natural gas in the town, used for fuel to the almost entire exclusion of artificial gas, and used to a certain small extent for lighting purposes, in spite of the opposition of the municipality, will naturally affect any comparison made with the other cities where there is no natural gas.

On the other hand, the existence in both Atlanta and Norfolk of a very large percentage of negro population undoubtedly has an important effect on the gas consumption in these towns, as it is a well known fact that, in Southern cities, the negro population uses so little gas that it may be practically eliminated as a factor in gas consumption. According to the census of 1900, the negro population in Wheeling was 2.7 per cent. of the total, in Atlanta it was 39.8 per cent., and in Norfolk 43.4 per cent.

On account of these conditions, figures showing the consumption of artificial gas per capita are practically worthless as comparisons. So far as they go, they indicate the two private companies have best succeeded in extending the use of their product. This result is natural when we consider that they maintain systems of canvassing and advertising, which are entirely absent at Wheeling. In all three places the territory seems to be well covered with street mains, but this meant more in Norfolk and Atlanta than it did in Wheeling, because the latter district is very closely built up. The number of people per mile of main in each case is:

Wheeling Municipality	1,259
Norfolk Company	865
Atlanta Company	728

The number of whites (the gas consuming class) per mile of mains, is:

Wheeling	1,225
Norfolk	490
Atlanta	438

Regarding the extension of the mains, the engineers report that the policy in Wheeling has not been liberal, while in both Atlanta and Norfolk it has been liberal. The information furnished by the engineers on the subjects of canvassing, lectures, demonstrations, and means employed for the sale and connection of cooking and other appliances, indicate that Wheeling has been practically dead in respect to these subjects, while at Atlanta and Norfolk great activity is displayed. The existence of the natural gas at Wheeling undoubtedly affects their activities in this respect, though it has not affected the character of the service, or of the plant, which, as the writer personally knows, was largely obsolete fifteen years ago.

III. PLANT.

The engineers' report indicates that the Wheeling plant is in bad condition. There is no provision or room at the works for an increase in the manufacturing capacity. They pronounce the plant as antiquated and disorderly.

Neither Wheeling nor Norfolk have any railway facilities, but Atlanta has an elevated switch directly into the coal shed. Wheeling being entirely a coal gas works, while Norfolk is a combined coal-and carburetted water gas plant, 60 per cent. of the total make being carburetted water gas, the existence of railroad facilities is of greater importance in the case of the former than it is of the latter.

In both Atlanta and Wheeling the site is completely occupied by buildings and apparatus, but at Norfolk there is plenty of ground for future extensions.

The generating apparatus at Wheeling is antiquated and inefficient. That of Norfolk and Atlanta is modern and efficient. As a consequence, the yield per retort per day is very much smaller at Wheeling than at the other places, and the cost of retort house labor, even if the same quality of management existed at all three places, would be much larger at Wheeling than at the other works. In all three works the retort house labor is all performed by hand, none of the works being large enough to warrant installing either charging or drawing machinery.

The cost of retort house labor at Wheeling per 1,000 cubic feet of gas made was nearly three times as large as it should be with good management, this high cost being due not to high wages but partly to uneconomical equipment, and partly to the employment of more men than should have been necessary. It is more difficult to check up the cost per unit of labor in the distribution department, but judging from an analysis of the labor costs in the case of several service-laying jobs, the same conditions existed in this department as were found at the works.

In addition to the high cost of operation, the amount of gas produced per pound of coal at Wheeling is low as compared with the other works investigated, although it is well situated to obtain at a low cost a coal producing a high yield of gas per pound. The return from residuals is also small, as compared with the other works.

At Wheeling no daily report is made to the superintendent other than a record of the gas made and sent out. No record of the tools supplied to workmen is kept. Regarding the distribution system, the service pipes are uncoated, there is no system of testing its meters periodically, and no records are kept of the meter tests that are made. The engineers pronounce the cost of new service work as excessive. When streets are paved, the mains and services were not overhauled prior to the paving. There was no laboratory, nor any record of analyses, or of engineering experiments carried on. In general, it may be said, so far as condition of plant and operating efficiency is concerned, there could not well be a worse condition of affairs than the engineers report as existing at Wheeling. In the other two cities the record regarding condition of plant, and regarding the various points of practice mentioned above in the case of Wheeling, while it contains a few points of criticism, is on the whole satisfactory. In both cases the plant is pronounced to be modern and kept in an orderly condition.

IV. LABOR.

"The Labor Report," by Mr. Sullivan, should be read in this connection.

In the schedules there is comparatively little information on the question of labor. The engineers report that at Wheeling there is no system of badging or uniforming the employees, as there is at the other plants. All employees on outside work at Atlanta wear a badge and a cap bearing the name of the company, and at Norfolk the same class of employees have numbered badges. In reply to question H-139, the engineers report at Wheeling that the superintendent has not the power of removal, and, as a result, the discipline of the employees is indifferent. Under the conditions described, "indifferent" is probably a very mild word. At the other plants the general morale and discipline of the employees is pronounced good.

The general impression made at Wheeling was that no one about the works took any more interest in his duties than was necessary to enable him to hold his job, and no one, either at the works or on the street, was interested in getting work done in an efficient manner. The power of appointment at Wheeling did not rest with the superintendent, and therefore the employees did not have the fear of discharge by him in case they did not perform their work properly. At Norfolk and Atlanta the certainty of prompt discharge in case they did not satisfy their superiors in the operation of the plant, acted to make the men work better and more efficiently than was the case at Wheeling.

A striking feature of the management at Wheeling is that the officials, whose duty it is to see that the employees perform their work faithfully, volunteered the information that none of the men under them work as they would if they were employed by a private corporation, and these officials, instead of considering this condition of affairs as a reflection upon themselves, seemed to think that it was a matter for which they were not, and could not be held responsible. The superintendent did not seem to possess sufficient initiative to overcome difficulties and disadvantages for the sake of securing economies in manufacture, although he freely admitted that these economies were not secured. None of the officials could be considered as being qualified for his position, and although they deplored the bad conditions, they did not appreciate how bad these conditions were.

The management at both Norfolk and Atlanta was in strong contrast to that at Wheeling, the officials in each of the former places striving to secure the best possible results with the conditions as they were, while at the same time working to have the conditions improved.

The relative merits of the Wheeling system, and the Atlanta and Norfolk system, cannot be fully appreciated by laymen, but a reading of the schedules, including the labor report, and Prof. John Gray's discussion of the situation, will indicate to even the least experienced something of the loss and demoralization that follow in the wake of municipal gas operation in America.

Justice between a supplier and purchaser of a commodity, requires as essentials, a knowledge of quality and quantity. Satisfaction in the use of gas requires a quality suited to the use. Wheeling has no means of determining the quality of its gas. Honest dealing requires an honest measure. The means Wheeling has provided for determining the accurarcy of consumers' meters makes them appear correct where they are recording more gas than is passing through them. The Wheeling Gas Department fails in the essenitals of good service and correct measurement.

Our most instructive comparison of the results of municipal operation and private operation is furnished by the experience of the city of Philadelphia, as set out in Dr. L. S. Rowe's history of "The Relation of the City of Philadelphia to the Gas Supply." This history is a part of the record of the Commission. It covers two periods—one of ten years of municipal management, and the other of approximately nine years of company management.

Dr. Rowe, commenting on the illuminating power of the gas for the first period, indicates that it averaged about 19 candles through the period. The gas at that time was tested through an argand burner calculated to develop its highest obtainable illuminating power. If this gas had been tested as the gas supplied by the company now operating the plant, is tested, through such a burner as the company will give free of charge to any applicant, it would have shown approximately 17.9 candle power. This was from the works producing coal-and water gas, the gas from the other two works was—as frequently tested by, and for, the writer—below 14 candles; hence, 16 is a liberal figure for the average candle power of the gas in Philadelphia during the later years of municipal operation. And this is the figure to be compared with 22 candle power gas now supplied to the citizens of Philadelphia under company operation.

Referring to naphthaline troubles, and speaking of an effort on the part of the city to prevent them, Dr. Rowe says: "Even this, however, was but a partial remedy, and just complaints against the quality of the gas delivered constantly increased during the period of municipal operation."

Dr. Rowe's report contains many suggestions of improper conduct on the part of the city officials, under municipal operation. We have no knowledge that enables us to endorse the statements. They, however, call attention to the possibility of troubles of this kind under municipal trading.

Dr. Rowe has shown and stated the service under municipal management to be increasingly poor. He speaks of the service under private management as follows: "The gas service since the beginning of the lease has been such as fully to satisfy the demands of public opinion. Even the most prejudiced critic must agree that the officials of The United Gas Improvement Company have done everything in their power to improve the service in every respect. Complaints are given prompt attention and adjusted in a spirit of fairness."

Speaking of the character of the plant, during the period of municipal operation, Dr. Rowe says: "There never was a time during the entire period of responsible (direct municipal) control when it could truly be said that the works were in an efficient condition."

Speaking of the attitude of the public toward the proposition to end municipal operation, Dr. Rowe says: "It is true that no strong public opposition developed, due largely to the fact that the people had become wearied with the inadequate gas service, and looked upon the leasing proposition as a possible means of relief." "At the time the lease was signed every effort was made by both the mayor and members of councils, to convince the people that the terms were most advantageous to the city."

Dr. Rowe shows the city to have lost $981,593.30 during the last four years of municipal operation—$245,398.32 per year, the price of gas being $1.00 per thousand cubic feet. He also shows the city to have received in cash from the operating company, during eight years of private operation, $3,933,398.61, or $491,674.83 per year— a net gain in cash to the city of an average of $737,000 per annum. The advantage to the consumer, who still pays $1.00 per thousand cubic feet of gas, comes from the increase of 37 per cent. in the amount of light obtainable, all the improvement in service which Dr. Rowe credits the private operation, the introduction of 180,000 gas cooking stoves without charge for connections, and the expenditure of approximately $2,000,000 in gratuitous work in the direct interest of individual consumers.

The Commission's records indicate a high degree of efficiency in the company operation of the Philadelphia gas works, and kindly and liberal treatment of employees. On these latter points Dr. Rowe speaks as follows: "As has been shown (under municipal management), there were abuses in almost every branch of the operation. The purchase of coal and the residuals products were each under the control of favored individuals; the wages account was padded with incompetents, the friends of men prominent in city politics." "It is unquestioned that there were leaks in the management of the gas works at other points than the distributing system; it is true that the labor account was debauched, and it is certain that in the purchase and sales departments there were influences at work which worked harm to the city's interests. But the loss through such sources was inconsiderable when compared with those inflicted by councils by the senseless blocking of the way to improvement in cutting off the appropriations for modernizing the plant. During the entire period of municipal operation the officers in charge were engaged in a losing fight to preserve the works from ruin. There never was a time during the entire period of responsible control when it could truly be said that the works were in an efficient condition."

This, in brief, is the history of municipal ownership and operation, as affecting gas, in one of our largest and most typically American cities. The lesson it holds is especially forceful, from the fact that in that city the public utility was for years under municipal

ownership and operation, with what result to the city and to the consumer, Professor Rowe has told us; and that the people of that city were given low candle power gas and poor service until, weary of municipal incompetency, the city leased the entire system to an operating company.

CHAPTER V.

AMERICAN ELECTRIC LIGHTING UNDERTAKINGS.

It is extremely difficult to find in the United States, examples of municipal and private electric plants which may be instructively compared. The only large cities which have attempted municipal ownership have confined themselves to street lighting. The only municipalities which have gone into commercial lighting are so small that they are subject to none of those difficulties which attend municipal and private operation in large American cities.

For these reasons no direct comparisons have been attempted in this report. Instead, the Commission has investigated four of the best known American municipal electric plants, and has measured their fitness by accepted standards of proper management and structural efficiency.

The four plants examined are those of Chicago, Detroit, South Norwalk and Allegheny. Of these, South Norwalk is the only one that does commercial lighting. Being a town of only 6,591 inhabitants, it requires but eight employees, but it has been selected because it has acquired a reputation of being an example of the success of municipal ownership. The Detroit plant, with political conditions relatively favorable, and the Chicago plant, helped by comparison with other local and more disheartening municipal conditions, have likewise acquired the reputation of being examples of the advantages of municipal ownership, and it is, therefore, of peculiar interest to have a definite determination as to whether these plants are worthy of the confidence placed in them by the advocates of municipal ownership. The Allegheny plant is not so prominent, but was selected for the reason that it was one of the first municipal electrical undertakings in this country, and had a good reputation among advocates of municipalization.

I. SERVICE.

a.—Price to Consumer.

The cost of the service of the four undertakings examined has been found to be extremely difficult to determine, owing to the lack of method with which the accounts of the undertakings have been kept. For instance, in Allegheny it was found that the books were not kept on the double entry system, and such classification as was attempted, was not in sufficient detail for the purpose of answering the list of questions prepared in the Commission's schedules.

Similar conditions were found in Chicago, where the accounts not only were not kept in detail or in conformity with any particular system, but were even affirmatively misleading, as a result of

the habit of charging out bills erroneously, where the appropriation for a particular class of expense had been exhausted. Even in construction work, no detailed record is kept and no separate balance sheet of the department is prepared at the close of the fiscal year—conditions which make it difficult to imagine how the busy people of Chicago can form that clear and intelligent opinion as to the financial operations of their plant, which is often said to be one of the main assurances of a city plant's success. But by long and hard work, the accountants of the Commission were able to make up a statement of total cost of plant and operation, that is so far correct, as to contain no items not properly chargeable to the operation.

Detroit's accounts show good book-keeping, but are not in the detail that would be possible if care were taken to meter all current.

All necessary information *may* be contained in the ledgers of the South Norwalk undertaking, but as now arranged that information is unavailable.

In this connection it is interesting to note how seldom all of those costs, which it has often been claimed are not charged against their plants by municipal undertakings, have been fully included in their accounts:

	Allegheny.	*Chicago.*	*Detroit.*	*So. Norwalk.*
Taxes	No.	No.	No.	No.
Accident insurance	No.	No.	No.	No.
Fire insurance	Yes.	No.	No.	Yes.
Boiler insurance	Yes.	No.	Yes.	Yes.
Water used by plant	No.	No.	....	No.
Claims and damages	No.	No.	Yes.	Yes.
Rentals of buildings used but not owned	Partly.	Partly.	No.	....
Interest on bonds	No.	No.	No.	Yes.
Interest on other liabilities	No.	No.	....	Yes.
Depreciation	No.	No.	Partly.	P'tly.
Sinking funds	No.	No.	No.	No.

From this table it appears that none of the cities take note of the fact that by operating themselves they lose the taxes which they would otherwise have received from a company. Only two are safeguarding themselves against fire losses. One does not even safeguard itself against boiler explosions. None of the three plants that use the city's water, charge themselves with any part of the cost of supplying that water. Only one of the two that use city buildings not owned by the department, pays for such use. Only one charges itself with the interest on the bonds issued to build its plant, and only one charges itself with interest on other liabilities.

The Commission, through its experts, has carefully calculated the charges of each plant, which were wrongly omitted in the accounts of the municipality. In Allegheny they were found, exclusive of interest, to be $43,821, made up of charges for taxes, accident insurance, depreciation, water consumption, proportion of salaries, telephone rent, and care of horses. These items raise the plant's operating cost from $104,931 to $148,752, and if

insufficient pressure, and points out that if the pressure were raised so that all the citizens could obtain a proper supply, the consumption would increase to such an extent that the capacity of the plant would be insufficient. He then describes the attempts that have been made for many years, by successive city engineers to adopt the use of meters as a means of reducing the wastage, but the city council has not provided the appropriation. The council has recently made an appropriation, and it is the intention to set meters as fast as possible on certain classes of services. It is stated that the capacity of the tunnels carrying the lake water to the pumps is nearly reached, and, allowing for the growth in population, no sooner will the contemplated additions to the plant be completed than the city will face the same problem of the necessity for an additional water supply. It should be borne in mind that in Chicago there is no water stored in reservoirs, everything depending on the pumps.

Regarding Cleveland, the engineer states:

> "Sources of supply abundant; facilities for developing it sufficient for needs in 1905, and, when the additions now in progress are completed, will be adequate for several years to come."

From the table it is to be noted that the maximum consumption very largely exceeded the minimum daily capacity, but it should be borne in mind that there are 108,000,000 gallons stored in reservoirs.

At Syracuse, the maximum daily capacity is exceeded by the maximum daily consumption, but there is 120,000,000 gallons storage. The engineer states that the capacity of the present conduit leading from the lake is about exhausted, and that a new one will be needed in the near future.

At Indianapolis, the relation between the maximum consumption and the capacity is more satisfactory. It should be stated that the figure given in the table for the maximum daily consumption in 1905 included the water that was used during a large fire. The engineer states that the maximum day for domestic consumption is only 21,280,294 gallons.

Commenting on the figures given for New Haven, it should be stated that, as water is delivered by gravity, it is very difficult to determine the exact capacity. The engineer states that the figures given in this table are the additions of the total capacities, and, as the maximum of all sources will not be reached at any one time, the figure given for the maximum is larger than it should be, and the figure given for the minimum is, for the same reason, smaller than it should be. Making due allowances on this account, it might be stated that the maximum daily capacity can be estimated as 33,000,000 gallons and the minimum daily capacity as 27,000,000 gallons.

This inquiry shows that the two companies have used more foresight, and are better equipped to take care of the business, and of the growth of the city than are the municipalities.

I. PRESSURE.

The question of character of service resolves itself into an examination of the pressures prevailing throughout the city. The first question under this heading has reference to the number and location of pressure gauges. Chicago is deficient in this respect, as it has only a recording gauge at each pumping station. There are no recording or other gauges at the office, shops or other points away from the pumping stations. There is a non-recording pressure gauge on each pump.

Cleveland is likewise deficient in recording pressure gauges. There is reported to be 5 on the force mains, but apparently not any on the low pressure system. There are 26 non-recording pressure gauges at the fire engine houses. These are read hourly and the summary is reported weekly. If these gauges are accurately read and summarized, the readings will give a good idea of the pressures at various points in the city.

At Syracuse, where there are no pumping stations, there is a recording gauge maintained at the office and another one at the repair shop.

At Indianapolis, each pumping station, the company's office, and each of the fire engine houses is equipped with a recording gauge.

At New Haven, recording gauges are maintained at the superintendent's office, at each pumping station, and at one point in a vault on the street. There are also three recording gauges at fire engine houses.

From the above it is evident that the companies are better equipped than are the municipalities to know what service they are rendering.

At Chicago the average pressure on discharge mains for all pumping stations, except Washington Heights, was 39.91 pounds. Table No. 9 under question H 85 shows that the greater portion of the area of the city received a pressure between 30 and 15 pounds; 12 per cent. of the area of the city was below 15 pounds; 3 per cent. of the area was below 10 pounds. Table No. 8, given under the same question, contains records taken during a special examination of the water supply, made by the National Board engineers in June and July, 1905, and shows minimum static pressure on hydrants within the area covered by the main service to the city as 3 pounds per square inch. The pressures were fairly uniform at the pumping stations, but were not uniform at remote points. It was not possible to obtain a definite answer as to the lowest pressure on the distributing system, as no recording gauges were maintained. Complaints of lack of pressure were very numerous. Houses in certain districts can get water in their upper stories only at night. Private pumps were required in all high buildings. Our engineer summarizes the result of his investigation as follows:

> "Estimating from gauges in pumping stations and from reports of tests made over the system at various

> times, the average static pressure on hydrants nearest pumping stations was about 34 pounds. The average static pressure at hydrants over the system was about 20 pounds, and over certain large areas to the southwest the average pressure was about 10 pounds."

At Cleveland, the pressures on the discharge mains at the three pumping stations were 90 pounds, 64 pounds and 59 pounds respectively. The lowest pressure on the distributing system is recorded as 0. There do not seem to be any figures stating the average pressures prevailing throughout the city. The engineer states:

> "They were in most cases sufficient to give good service to the upper stories of houses, except where such houses were located near the line dividing the low service from the first high service district. Complaints not very numerous; there were some complaints principally from owners of high buildings located on high points in the low service district."

At Syracuse, the pressures are remarkably uniform. Two recording gauges at different points on the system, but at a fairly low elevation in the city, show an average pressure of about 90 pounds. The engineer says this may be considered the average maximum pressure of the system. The highest pressure on the system is given as 91.3 pounds and the lowest as 0. This last condition is described as follows:

> "There are some houses on the system, especially on the hills near the Syracuse University, which are so high that they do not have good pressures. In ten or twelve of these houses water will flow only in the cellars, and when water is low in Woodland reservoir, as was the case in February, 1905, the persons living in these houses are without water. Some of them leave their faucets open, relying upon a water ram in the mains to fill tanks in the cellars, from which water is often pumped by hand to attic tanks. Most of these houses are comparatively new, having been built on the hill since the reservoir was constructed."

At Indianapolis, the normal pressure in the main service district averaged 68 pounds during the year; fire pressure from 110 to 115 pounds. The pressure was uniformly maintained. The highest pressure was about 120 pounds near the pumping station, and the lowest about 58 pounds. Complaints are not numerous.

At New Haven, the highest pressure is given as 53 pounds and the lowest as 18 pounds. Complaints are reported as not very frequent. Under question H 22, the chief of the fire department is quoted as follows:

> "The chief considers the supply adequate when steamers are used. He further states that the mains are laid on almost every street, are well connected and have very few dead ends; that the multiplication of sources

of supply insures plenty of water; and that in the dryest of seasons there is never any let up. Everybody uses all he wants to and never knows what it is to be short. Also that the mains have never broken during the time of fire, and that the fire department has never been handicapped by the breaking of mains."

From this summary of the pressures maintained, it is evident that the citizens in the two cities where the water is supplied by companies, are on the whole better supplied than in those of the other class. There is apparently no section of either Indianapolis or New Haven where the citizen cannot obtain an adequate supply of water, and apparently this cannot be said of any of the municipal plants examined. It seems from these records that at Chicago there are thousands of citizens who are inconvenienced with an insufficient supply of water at their residences and places of business. At Cleveland those buildings that are located near the edge of the low pressure district are similarly poorly supplied, and at Syracuse there is one section which at certain seasons has no water at all. It is true that in the latter case this comprises only a few houses, and it is evident that the greater part of the city is well supplied.

The insurance companies have recently advanced rates in each of the cities under consideration—with the exception of Syracuse—alleging water works deficiencies as the cause. The amount of the rates chargeable to water supply deficiencies is:

In Chicago, $1,250,000.

In Cleveland, $48,000.

In Indianapolis (not given in dollars).

In New Haven (not given in dollars).

The water works expert says, in the New Haven report, "It would seem, as has already been observed in other cities, the advance in rates is based less on the actual merits of the case than on the desire to quickly recoup the losses at San Francisco and Baltimore."

A feature of water supply that is of importance to the citizens of a growing city has reference to whether the policy of the authorities in making extensions is liberal or the contrary, and as to whether such extensions are made promptly or the contrary.

On this point at Chicago, the policy is reported to be apparently fairly liberal on the whole. There were, however, many demands, and available appropriations were often limited. There is in the Chicago Water Department a division of water pipe extension, which determines the size of pipe required. An ordinance by the city council is required for every extension, and the delay in passing these ordinances has frequently caused a delay in extending the service. Apparently the division of water supply extension made extensions promptly when they were once ordered by the council. As a rule, the demand has always preceded the extension.

In Cleveland, an extension of the mains has generally awaited the demand for the same. The extensions are ordered by the Board

of Public Service. No ordinance by council is required, except the regular semi-annual appropriation ordinance, and work or mains extended was not delayed for lack of funds. It seems the board requires the estimated revenue for the first year to be 6 per cent. or more. Parties developing real estate can get mains laid by depositing $1 per lineal foot, which sum is refunded when the revenue from water amounts to 6 per cent. Mains are also laid by the city, without cost to the property owners, on the streets about to be paved, but this does not often happen, as the mains are usually laid before the demand for paving arises.

At Syracuse, an extension of the mains has generally awaited the demand. No ordinance by councils is required, the decision being made by the Commissioner of Public Works, on recommendation by the deputy city engineer. Where the receipts will pay a reasonable return on the cost, the extension is made. In all cases a frontage tax of 5 per cent. per foot is levied on all property fronting on each side of the street on which the main is laid. The engineer remarks:

> "The frontage tax alone will pay good interest on all sizes of mains from 12 inches down, so that the department cannot well lose money by extensions."

At Indianapolis, the mains have been "rapidly extended in advance of ordinances, and in advance of the demand." The company was free to extend mains where it wished. By the terms of its contract with the city, the latter has power to direct where its extensions shall be made up to 40,000 feet per year, and this fact seems at times to have delayed the installation of mains because the city councils were slow to act. It is to be noted, however, that the extensions made by the company exceed the requirement of 40,000 feet per year, the average extensions for the past fifteen years being [illegible] feet per year. The policy regarding extensions is therefore apparently liberal.

At New Haven, the mains have often been extended in advance of the demand. [illegible] to the company, which is free to use its judgment regarding the making of extensions. The city is supplied with mains to an unusual extent. [illegible]

water, to the means adopted to ascertain the actual quality of the water, and finally to the consideration of the quality of the water.

Under the first heading it may be said that Chicago, Cleveland and Syracuse each supply the water in its natural condition. As Chicago and Cleveland each draws its supply from one of the Great Lakes, there is no necessity for any sanitary inspection of the source from which the water is drawn.

In the case of Syracuse, where the water is drawn from a lake, the water department maintains two employees who live at different points on the shore of the lake, and whose duty it is to patrol the same and report any infractions of sanitary regulations. It seems that on the shore of this lake are a number of summer cottages, and one of the employees referred to, keeps a watch on them during the summer and fall, when they are occupied. In 1905, a committee composed of the members of the Chamber of Commerce, a local physician, and others, made inspection of the shores of the lake.

At Indianapolis, the water drawn from the White river and from Fall creek, consisting of two-thirds of the total supply, is filtered by slow sand filtration. The canal, which carries the water from the White river to the city, is patrolled by an employee of the company, who is clothed with police powers.

At New Haven, where the water is drawn from six small lakes, none of the water was filtered in 1905, but during that year filters were being constructed, and beginning with 1906, the water from Lake Whitney, which is the only lake in which the purity of the water was threatened, has been filtered. There is a daily inspection of the watersheds of these lakes, by the company's inspectors, and a less frequent inspection by the superintendent and other officers of the company.

It is good engineering practice for the water department or company to own or control the land surrounding, or the entire watershed of, the source of supply. In the case of Chicago and Cleveland, of course this is not possible nor necessary. In the case of Syracuse, the municipality does not own any land surrounding the lake. At Indianapolis, the water company owns a narrow strip of land around several of the dams in the White river, and also controls the shores of the canal. At New Haven, the water company has acquired more than half of the entire watershed of five of its lakes, and is now acquiring more as rapidly as possible. It now owns 7,000 acres. The sixth lake—Lake Whitney—where the watershed is not owned, has its water treated by filtration. On this point the contrast between the practice at Syracuse on one hand, and at Indianapolis and New Haven on the other can be compared to the advantage of the latter.

This phase of the question may be summarized with the statement that while the natural conditions in the different cities call for different methods of treatment, it is evident that the two companies were more solicitous regarding the purity of the water supply, and adopted more thorough means for insuring the same

than did the three municipalities which ran their own water departments.

The second point of inquiry refers to the means adopted to ascertain the quality of the water. At Chicago samples from all of the pumping stations are analyzed daily, except Sundays and holidays. These analyses are made by the department of health, and the results as to whether the water is "safe" or "unsafe" are published in the daily papers. The health department also publishes weekly and annual bulletins containing more details of the anayl-ses.

At Cleveland, sanitary chemical analyses are made weekly. Chemical analyses and bacteriological analyses are made daily, except Sundays and holidays. The first are made by Mr. Pate, city chemist, and are not published. The second class of analyses is made under the direction of Dr. Howard, city bacteriologist. The results of these were summarized in the report of the water department for 1905. During 1905, Dr. Whipple, consulting engineer, and the superintendent of the water works division, made special examination and reported on the water supplied, and extracts from this were published in the 1905 report of the water department.

At Syracuse, chemical analyses are made of water drawn from the faucet in the laboratory once a month. Bacterial analyses of water from Woodland reservoirs are made twice a month from January to May inclusive, and four times a month from June to December inclusive. The former analyses are made by the city chemist and the latter by the city bacteriologist. The results are not published. During 1905, Dr. May, city bacteriologist, collected about 75 samples of water around the shores of the lake and made analyses and a report.

At Indianapolis, analyses of the water are made daily by Mr. Jordan, chemist and bacteriologist of the company. A few analyses were also made by the department of health. The results were not published.

At New Haven, analyses of water collected from each source of supply are made monthly by Professor Smith of Yale College, consulting chemist of the water company. In addition, daily bacteriological analyses are made by the superintendent of filters, of water from each of the sources of supply. As a rule the results are very good.

[illegible] has reference to the actual quality of the water [illegible] 98 per cent of all the samples taken were [illegible] per cent were pronounced [illegible]

[illegible] from Scranton, Pa., are made, as bearing [illegible] Exhibit [illegible] not necessarily a- [illegible] made to [illegible] supply is used [illegible] number of people of

small or moderate means, and if the reported death rate from typhoid fever be correct, this would corroborate the statement of the city chemist just referred to, for if the water were actually bad 17 per cent. of the time, the typhoid death rate would doubtless be much higher."

"In view of these facts and in view of the further fact that the city's health department reported that 17 per cent. of all the samples of city water analyzed by it in 1905 were 'unsafe' the water should, in the opinion of the writer of this report, be classed as unreliable and, therefore, not a good water for drinking purposes."

"Water supply is subject to rapid changes from 'safe' to 'unsafe,' and it is not always possible to give warning of these changes. The purity of the water cannot be relied upon, and the water, therefore, cannot be classed as good from a sanitary standpoint."

At Cleveland, Dr. Howard, the city bacteriologist, is quoted as follows in his report to the health department:

"Dr. Howard says that the water 'cannot be called a good water, a safe water,' also that 90 per cent. of the intelligent people in fairly good financial circumstances do not drink it. He cites instances of prominent physicians who forbid their patients to drink it, and who, when typhoid is raging in the city, have at most only one or two cases. Mr. H. O. Way, assistant city bacteriologist, who under the supervision of Dr. Howard, made the bacteriological analyses of the water in 1905, states that the presence of the colon bacillus may be reasonably assumed as cause for classing the water as unsafe, it being understood that the word 'unsafe' does not necessarily always mean that the water is actually bad or unfit to drink. Similarly the absence of colon bacillus should fairly cause the water to be classed as 'safe,' although the water might possibly be bad without the colon bacillus being found in the particular sample examined. The general average, however, of all examinations indicates that the percentages of times the colon bacillus is found in the water may be fairly taken as the percentage of times that the water is unsafe. Mr. Way further states that observations of all the other local conditions affecting the water in Cleveland has borne out the statement that when the colon bacillus is found in the city supply, the water should be called unsafe. Mr. Way found the colon bacillus twelve times in 303 examinations of city water during 1905."

The following quotation is also made from Schedule III under question H 55:

"In view of all the foregoing facts and opinions, it would seem that the water is good almost all the time, but that its purity cannot always be relied upon, as it is subject on infrequent occasions to sudden changes from good

to bad. The water should, therefore, in the writer's opinion, be classed as fair."

At Syracuse, our investigator sums up this question as follows:

"Water is not only good from a sanitary standpoint, but is also remarkably soft, and for a lake water unusually free from color."

At Indianapolis, "the water supplied in 1905 was of good sanitary character," writes the inspecting engineer, who makes also the following comment on the character and efficiency of the filter plant:

"As indicated by the photographs (not reproduced here), the filter plant presents a very neat and attractive appearance. All of its appliances and accessories are strictly up to date, and the results obtained during 1905 after the filters had once been gotten into proper running order, were remarkably good, showing an average efficiency in the removal of bacteria of considerably over 99 per cent."

At New Haven, the following two extracts contain the conclusions drawn by our enginer regarding the quality of the water supplied:

"Writer did not see all records; was informed that colon bacillus was sometimes found in all the water, not excepting Lake Wintergreen, whose water is practically above suspicion; but that on all sheds, except Whitney, the colon was generally believed to come from animals, and therefore to be harmless."

"Water occasionally has slight color and taste from vegetable matters. From sanitary standpoint Lake Whitney water should be rated as fair during 1905. Waters from other four sheds, good."

The following extracts on this subject are taken from interviews had by our engineer:

Dr. Wright, president of the Board of Health—"Dr. Wright states that while the water sometimes had some color and taste from vegetable matter, he considers it was good from a sanitary standpoint in 1905, and that the water is not responsible for any of the typhoid at present. Finally the doctor says that in his opinion, the New Haven water supply, as a whole, compares very, very favorably with that of almost any other city."

Mr. Bailey, clerk of the Board of Health and secretary of the Union League Club—"The company takes extraordinary precautions to protect its source of supply, and that he believes its water is better than many of the peddled drinking waters. He attributes the rather widespread use of the latter partly to the scare resulting from the epidemic of 1901, partly to the color and taste which city water sometimes has, especially in spring time, from vegetable matter, and partly to active advertising on the

part of the sellers of bottled waters. He considers that the city water was pure from a sanitary standpoint in 1905."

Our investigating engineer also adds the following:

"As already stated, the typhoid rate in 1905 was somewhat higher than the average for the last few years. The writer of this report was not, however, able to find any competent evidence of the fact that the increase was due to the water supply. In view of all of the foregoing facts and opinions, the writer of this report would rate the quality of Lake Whitney water during 1905 as fair, and of that from the other four watersheds as good. Now that Lake Whitney water is filtered, all the water should, in the writer's opinion, be classed as good."

It is commonly assumed that the number of deaths from typhoid fever, in proportion to the population of the city, is an index to the purity of the water supplied. Undoubtedly there have been, and are, cases where pollution of the city water supply has caused an increase in the number of deaths, but it does not necessarily follow that a relatively high death rate by typhoid fever per capita is due to the quality of the water supply. Drinking water is not the only means by which this disease is spread. The figures taken from the report are as follows:

City.	*Population Taking Water from Mains.*	*Cases of Typhoid Fever Reported or Estimated.*	*No. of Deaths.*	*Deaths by Typhoid Fever per 100,000 Pop.*
Chicago	1,800,000	Not reported.	329	18.3
Cleveland	457,447	675	67	14.6
Syracuse	114,000	147	18	15.8
Indianapolis	120,000	412	71	59.2
New Haven.....	120,000	247	49	40.8

Taken at their face value, these figures show very unfavorably for the two cities where the water is supplied by companies, but it is evident that the investigating engineer does not believe that in either case the high number of deaths in these cities is due to the quality of the water supplied by the water companies. Regarding Indianapolis, I quote as follows from his answer to question H 158: "Interviews with members in the Indianapolis Board of Health as well as all that the writer was able to learn from other competent sources, corroborate the opinion that the water supplied in 1905 was of good, sanitary character."

"The president of the Board of Health stated that he had from time to time analyzed the water from about four thousand private wells in Indianapolis, and ordered closed 75 per cent. of all the wells that he had examined, but that the wells would soon be used again, as there was no law by which the board could enforce these orders. The president and secretary of the board both stated that they had tried for a long time to get an ordinance compelling the closing of cesspools, and the putting in of

connections to sewers, but that real estate men and property owners had always succeeded in defeating the ordinance. The city has a plumbing ordinance, but no plumbing inspector, and the Board of Health is said to have been unable to get one appointed because of the opposition of the master plumbers, who fear favoritism in the purchase of supplies."

The inspecting engineer adds the following:

"In view of the statements quoted above, it is the writer's opinion that a high typhoid fever death rate might naturally be anticipated, even with the purest possible city water supply."

Again in his answer to question H 166, there is a quotation from the report of an expert committee appointed by the city, and the company, which was made October 26, 1904:

"Page 31 of that report estimates that there are 25,000 private wells used more or less regularly for drinking purposes, showing that a majority of people get their drinking water from these sources, rather than buy the water furnished by the company. Page 29 furnishes further information, showing that after an existence of 38 years the people have not abandoned their wells. This report furnishes conclusive evidence that many of the citizens still cling to their wells without regard to sanitary conditions or convenience. Water so easily obtained as it is from the various veins makes severe competition for a water works, whether it be owned by the city or a private corporation."

In the case of New Haven, while the report states that the people depend for their supply of water mainly on the water furnished by the water company, as well water is not easily obtained in that city, yet it seems that the water is not to be blamed for the high number of cases of disease. Under Question H-55, the investigating engineer quotes from the interview with Dr. Wright, President of the Board of Health, as follows:

"A number of cases and five deaths occurred at the Almshouse, which is supplied from Lake Wintergreen, on whose watershed there was no possibility of pollution; and that he has had two outbreaks of typhoid this year directly traceable to milk. Dr. Wright states that while the water sometimes has some color and taste from vegetable matter, he considers it was good from a sanitary standpoint in 1905, and that the water is not responsible for any of the typhoid at present. Finally the doctor says that in his opinion the New Haven water supply as a whole compares very, very favorably with that of almost any other city."

In this connection I venture to quote again from Dr. Smith, the consulting chemist of the company: "Dr. Smith states further that the water has been better since

1901 than ever before; that the typhoid rate was higher than usual in 1905, but that he does not think that water was an important factor in the 1905 rate. Dr. Smith regards the water in 1905 as very good in sanitary quality."

The following is again quoted as the opinion of the investigator: "As already stated, the typhoid rate in 1905 was somewhat higher than the average for the last few years. The writer of this report was not, however, able to find any competent evidence of the fact that the increase was due to the water supply. In view of all the foregoing facts and opinions, the writer of this report would rate the purity of Lake Whitney water during 1905 as fair, and that from the other four watersheds as good. Now that the Lake Whitney water is filtered, all the water should, in the writer's opinion, be classed as good."

The conclusion drawn as a result of our investigation into the quality of the water, is that the water supplied by the two companies is good, sanitary water; that its quality is much better than the water supplied in Chicago; somewhat better than the water supplied in Cleveland, and quite as good as the water supplied at Syracuse. The latter place is blest with water from a source which, down to the date of this report, has remained pure without any special expense or effort on the part of the water department.

III. GENERAL.

Regarding the distributing systems of mains and services there is not much comment required. All of the cities use cast iron bell-and-spigot pipe, with lead joints, and in all cases the services are of extra strong lead pipe. In New Haven certain services are of wrought iron pipe.

Regarding the subject of meters, there is a certain number installed in all of the cities investigated, but Cleveland and Syracuse are the only cities where the meters are in large numbers. In Cleveland more than 68 per cent. of all of the services have meters on them, and in Syracuse more than 82 per cent. have meters. Under question H-64, the engineer gives an interesting account of the introduction of meters in Cleveland, and describes it as the "most notable act of the present administration." He commends the management for the introduction of meters, but criticizes the schedule of meter rates adopted as causing unjust discrimination, and as being unwise from the standpoint of good financial management. It seems that under these rates large profits are made on large consumers, while small consumers are supplied at a loss.

At Indianapolis, about one-third of the water supplied to consumers is metered, and at New Haven about one-quarter of the total supplied to consumers is metered.

Regarding the purchase of supplies, it is evident that the companies have greater freedom regarding contracts. In both Chicago and Cleveland, for any amount over $500, an ordinance by councils is needed and contracts must be advertised for two weeks. In Syracuse, the law provides that all purchases amounting to $50 or

insufficient pressure, and points out that if the pressure were raised so that all the citizens could obtain a proper supply, the consumption would increase to such an extent that the capacity of the plant would be insufficient. He then describes the attempts that have been made for many years, by successive city engineers to adopt the use of meters as a means of reducing the wastage, but the city council has not provided the appropriation. The council has recently made an appropriation, and it is the intention to set meters as fast as possible on certain classes of services. It is stated that the capacity of the tunnels carrying the lake water to the pumps is nearly reached, and, allowing for the growth in population, no sooner will the contemplated additions to the plant be completed than the city will face the same problem of the necessity for an additional water supply. It should be borne in mind that in Chicago there is no water stored in reservoirs, everything depending on the pumps.

Regarding Cleveland, the engineer states:

> "Sources of supply abundant; facilities for developing it sufficient for needs in 1905, and, when the additions now in progress are completed, will be adequate for several years to come."

From the table it is to be noted that the maximum consumption very largely exceeded the minimum daily capacity, but it should be borne in mind that there are 108,000,000 gallons stored in reservoirs.

At Syracuse, the maximum daily capacity is exceeded by the maximum daily consumption, but there is 120,000,000 gallons storage. The engineer states that the capacity of the present conduit leading from the lake is about exhausted, and that a new one will be needed in the near future.

At Indianapolis, the relation between the maximum consumption and the capacity is more satisfactory. It should be stated that the figure given in the table for the maximum daily consumption in 1905 included the water that was used during a large fire. The engineer states that the maximum day for domestic consumption is only 21,280,294 gallons.

Commenting on the figures given for New Haven, it should be stated that, as water is delivered by gravity, it is very difficult to determine the exact capacity. The engineer states that the figures given in this table are the additions of the total capacities, and, as the maximum of all sources will not be reached at any one time, the figure given for the maximum is larger than it should be, and the figure given for the minimum is, for the same reason, smaller than it should be. Making due allowances on this account, it might be stated that the maximum daily capacity can be estimated as 33,000,000 gallons and the minimum daily capacity as 27,000,000 gallons.

This inquiry shows that the two companies have used more foresight, and are better equipped to take care of the business, and *of the growth* of the city than are the municipalities.

I. PRESSURE.

The question of character of service resolves itself into an examination of the pressures prevailing throughout the city. The first question under this heading has reference to the number and location of pressure gauges. Chicago is deficient in this respect, as it has only a recording gauge at each pumping station. There are no recording or other gauges at the office, shops or other points away from the pumping stations. There is a non-recording pressure gauge on each pump.

Cleveland is likewise deficient in recording pressure gauges. There is reported to be 5 on the force mains, but apparently not any on the low pressure system. There are 26 non-recording pressure gauges at the fire engine houses. These are read hourly and the summary is reported weekly. If these gauges are accurately read and summarized, the readings will give a good idea of the pressures at various points in the city.

At Syracuse, where there are no pumping stations, there is a recording gauge maintained at the office and another one at the repair shop.

At Indianapolis, each pumping station, the company's office, and each of the fire engine houses is equipped with a recording gauge.

At New Haven, recording gauges are maintained at the superintendent's office, at each pumping station, and at one point in a vault on the street. There are also three recording gauges at fire engine houses.

From the above it is evident that the companies are better equipped than are the municipalities to know what service they are rendering.

At Chicago the average pressure on discharge mains for all pumping stations, except Washington Heights, was 39.91 pounds. Table No. 9 under question H 85 shows that the greater portion of the area of the city received a pressure between 30 and 15 pounds; 12 per cent. of the area of the city was below 15 pounds; 3 per cent. of the area was below 10 pounds. Table No. 8, given under the same question, contains records taken during a special examination of the water supply, made by the National Board engineers in June and July, 1905, and shows minimum static pressure on hydrants within the area covered by the main service to the city as 3 pounds per square inch. The pressures were fairly uniform at the pumping stations, but were not uniform at remote points. It was not possible to obtain a definite answer as to the lowest pressure on the distributing system, as no recording gauges were maintained. Complaints of lack of pressure were very numerous. Houses in certain districts can get water in their upper stories only at night. Private pumps were required in all high buildings. Our engineer summarizes the result of his investigation as follows:

> "Estimating from gauges in pumping stations and from reports of tests made over the system at various

> times, the average static pressure on hydrants nearest pumping stations was about 34 pounds. The average static pressure at hydrants over the system was about 20 pounds, and over certain large areas to the southwest the average pressure was about 10 pounds."

At Cleveland, the pressures on the discharge mains at the three pumping stations were 90 pounds, 64 pounds and 59 pounds respectively. The lowest pressure on the distributing system is recorded as 0. There do not seem to be any figures stating the average pressures prevailing throughout the city. The engineer states:

> "They were in most cases sufficient to give good service to the upper stories of houses, except where such houses were located near the line dividing the low service from the first high service district. Complaints not very numerous; there were some complaints principally from owners of high buildings located on high points in the low service district."

At Syracuse, the pressures are remarkably uniform. Two recording gauges at different points on the system, but at a fairly low elevation in the city, show an average pressure of about 90 pounds. The engineer says this may be considered the average maximum pressure of the system. The highest pressure on the system is given as 91.3 pounds and the lowest as 0. This last condition is described as follows:

> "There are some houses on the system, especially on the hills near the Syracuse University, which are so high that they do not have good pressures. In ten or twelve of these houses water will flow only in the cellars, and when water is low in Woodland reservoir, as was the case in February, 1905, the persons living in these houses are without water. Some of them leave their faucets open, relying upon a water ram in the mains to fill tanks in the cellars, from which water is often pumped by hand to attic tanks. Most of these houses are comparatively new, having been built on the hill since the reservoir was constructed."

At Indianapolis, the normal pressure in the main service district averaged 68 pounds during the year; fire pressure from 110 to 115 pounds. The pressure was uniformly maintained. The highest pressure was about 120 pounds near the pumping station, and the lowest about 58 pounds. Complaints are not numerous.

At New Haven, the highest pressure is given as 53 pounds and the lowest as 18 pounds. Complaints are reported as not very frequent. Under question H 22, the chief of the fire department is quoted as follows:

> "The chief considers the supply adequate when steamers are used. He further states that the mains are laid on almost every street, are well connected and have very few dead ends; that the multiplication of sources

of supply insures plenty of water; and that in the dryest of seasons there is never any let up. Everybody uses all he wants to and never knows what it is to be short. Also that the mains have never broken during the time of fire, and that the fire department has never been handicapped by the breaking of mains."

From this summary of the pressures maintained, it is evident that the citizens in the two cities where the water is supplied by companies, are on the whole better supplied than in those of the other class. There is apparently no section of either Indianapolis or New Haven where the citizen cannot obtain an adequate supply of water, and apparently this cannot be said of any of the municipal plants examined. It seems from these records that at Chicago there are thousands of citizens who are inconvenienced with an insufficient supply of water at their residences and places of business. At Cleveland those buildings that are located near the edge of the low pressure district are similarly poorly supplied, and at Syracuse there is one section which at certain seasons has no water at all. It is true that in the latter case this comprises only a few houses, and it is evident that the greater part of the city is well supplied.

The insurance companies have recently advanced rates in each of the cities under consideration—with the exception of Syracuse—alleging water works deficiencies as the cause. The amount of the rates chargeable to water supply deficiencies is:

In Chicago, $1,250,000.

In Cleveland, $48,000.

In Indianapolis (not given in dollars).

In New Haven (not given in dollars).

The water works expert says, in the New Haven report, "It would seem, as has already been observed in other cities, the advance in rates is based less on the actual merits of the case than on the desire to quickly recoup the losses at San Francisco and Baltimore."

A feature of water supply that is of importance to the citizens of a growing city has reference to whether the policy of the authorities in making extensions is liberal or the contrary, and as to whether such extensions are made promptly or the contrary.

On this point at Chicago, the policy is reported to be apparently fairly liberal on the whole. There were, however, many demands, and available appropriations were often limited. There is in the Chicago Water Department a division of water pipe extension, which determines the size of pipe required. An ordinance by the city council is required for every extension, and the delay in passing these ordinances has frequently caused a delay in extending the service. Apparently the division of water supply extension made extensions promptly when they were once ordered by the council. As a rule, the demand has always preceded the extension.

In Cleveland, an extension of the mains has generally awaited the demand for the same. The extensions are ordered by the Board

of Public Service. No ordinance by council is required, except the regular semi-annual appropriation ordinance, and work or mains extended was not delayed for lack of funds. It seems the board requires the estimated revenue for the first year to be 6 per cent. or more. Parties developing real estate can get mains laid by depositing $1 per lineal foot, which sum is refunded when the revenue from water amounts to 6 per cent. Mains are also laid by the city, without cost to the property owners, on the streets about to be paved, but this does not often happen, as the mains are usually laid before the demand for paving arises.

At Syracuse, an extension of the mains has generally awaited the demand. No ordinance by councils is required, the decision being made by the Commissioner of Public Works, on recommendation by the deputy city engineer. Where the receipts will pay a reasonable return on the cost, the extension is made. In all cases a frontage tax of 5 per cent. per foot is levied on all property fronting on each side of the street on which the main is laid. The engineer remarks:

> "The frontage tax alone will pay good interest on all sizes of mains from 12 inches down, so that the department cannot well lose money by extensions."

At Indianapolis, the mains have been "rapidly extended in advance of ordinances, and in advance of the demand." The company was free to extend mains where it wished. By the terms of its contract with the city, the latter has power to direct where its extensions shall be made up to 40,000 feet per year, and this fact seems at times to have delayed the installation of mains because the city councils were slow to act. It is to be noted, however, that the extensions made by the company exceed the requirement of 40,000 feet per year, the average extensions for the past fifteen years being 68,986 feet per year. The policy regarding extensions is therefore apparently liberal.

At New Haven, the mains have often been extended in advance of the demand. Petitions or applications for service are made to the company, which is free to use its judgment regarding the making of extensions. The city is supplied with mains to an unusual extent. There are mains in almost every street in the city. The policy in making extensions is apparently liberal. The secretary of the company states that "during his connection with the company he has never known of a refusal to extend mains on petition within the city limits; also that mains will be extended in suburbs, provided reasonable revenue, not necessarily for the first year, but within a reasonable number of years, is assured."

From this summary it seems evident that citizens, not on the line of mains, applying for water, are on the whole more apt to obtain it, and to obtain it promptly, in the two cities where companies operate the water works, than they are in those cities where the municipality does so.

II. QUALITY.

An inquiry regarding the quality of the water supplied may be made with reference to the means adopted to insure a pure

water, to the means adopted to ascertain the actual quality of the water, and finally to the consideration of the quality of the water.

Under the first heading it may be said that Chicago, Cleveland and Syracuse each supply the water in its natural condition. As Chicago and Cleveland each draws its supply from one of the Great Lakes, there is no necessity for any sanitary inspection of the source from which the water is drawn.

In the case of Syracuse, where the water is drawn from a lake, the water department maintains two employees who live at different points on the shore of the lake, and whose duty it is to patrol the same and report any infractions of sanitary regulations. It seems that on the shore of this lake are a number of summer cottages, and one of the employees referred to, keeps a watch on them during the summer and fall, when they are occupied. In 1905, a committee composed of the members of the Chamber of Commerce, a local physician, and others, made inspection of the shores of the lake.

At Indianapolis, the water drawn from the White river and from Fall creek, consisting of two-thirds of the total supply, is filtered by slow sand filtration. The canal, which carries the water from the White river to the city, is patrolled by an employee of the company, who is clothed with police powers.

At New Haven, where the water is drawn from six small lakes, none of the water was filtered in 1905, but during that year filters were being constructed, and beginning with 1906, the water from Lake Whitney, which is the only lake in which the purity of the water was threatened, has been filtered. There is a daily inspection of the watersheds of these lakes, by the company's inspectors, and a less frequent inspection by the superintendent and other officers of the company.

It is good engineering practice for the water department or company to own or control the land surrounding, or the entire watershed of, the source of supply. In the case of Chicago and Cleveland, of course this is not possible nor necessary. In the case of Syracuse, the municipality does not own any land surrounding the lake. At Indianapolis, the water company owns a narrow strip of land around several of the dams in the White river, and also controls the shores of the canal. At New Haven, the water company has acquired more than half of the entire watershed of five of its lakes, and is now acquiring more as rapidly as possible. It now owns 7,000 acres. The sixth lake—Lake Whitney—where the watershed is not owned, has its water treated by filtration. On this point the contrast between the practice at Syracuse on one hand, and at Indianapolis and New Haven on the other can be compared to the advantage of the latter.

This phase of the question may be summarized with the statement that while the natural conditions in the different cities call for different methods of treatment, it is evident that the two companies were more solicitous regarding the purity of the water supply, and adopted more thorough means for insuring the same

than did the three municipalities which ran their own water departments.

The second point of inquiry refers to the means adopted to ascertain the quality of the water. At Chicago samples from all of the pumping stations are analyzed daily, except Sundays and holidays. These analyses are made by the department of health, and the results as to whether the water is "safe" or "unsafe" are published in the daily papers. The health department also publishes weekly and annual bulletins containing more details of the anayl-ses.

At Cleveland, sanitary chemical analyses are made weekly. Chemical analyses and bacteriological analyses are made daily, except Sundays and holidays. The first are made by Mr. Pate, city chemist, and are not published. The second class of analyses is made under the direction of Dr. Howard, city bacteriologist. The results of these were summarized in the report of the water department for 1905. During 1905, Dr. Whipple, consulting engineer, and the superintendent of the water works division, made special examination and reported on the water supplied, and extracts from this were published in the 1905 report of the water department.

At Syracuse, chemical analyses are made of water drawn from the faucet in the laboratory once a month. Bacterial analyses of water from Woodland reservoirs are made twice a month from January to May inclusive, and four times a month from June to December inclusive. The former analyses are made by the city chemist and the latter by the city bacteriologist. The results are not published. During 1905, Dr. May, city bacteriologist, collected about 75 samples of water around the shores of the lake and made analyses and a report.

At Indianapolis, analyses of the water are made daily by Mr. Jordan, chemist and bacteriologist of the company. A few analyses were also made by the department of health. The results were not published.

At New Haven, analyses of water collected from each source of supply are made monthly by Professor Smith of Yale College, consulting chemist of the water company. In addition, daily bacteriological analyses are made by the superintendent of filters, of water from certain of the sources of supply. As a rule the results are not published.

The third inquiry has reference to the actual quality of the water delivered. At Chicago, 83 per cent. of all the samples taken were pronounced "safe." Seventeen per cent were pronounced "unsafe."

The following extracts from Schedule III are made, as bearing on the question now under consideration:

> "As stated in the report of the city chemist (Exhibit 7, see H 60), the word 'unsafe' does not necessarily always mean that the water is bad, or unfit to drink.
>
> "The writer is informed that the city supply is used for drinking purposes by a large number of people of

small or moderate means, and if the reported death rate from typhoid fever be correct, this would corroborate the statement of the city chemist just referred to, for if the water were actually bad 17 per cent. of the time, the typhoid death rate would doubtless be much higher."

"In view of these facts and in view of the further fact that the city's health department reported that 17 per cent. of all the samples of city water analyzed by it in 1905 were 'unsafe' the water should, in the opinion of the writer of this report, be classed as unreliable and, therefore, not a good water for drinking purposes."

"Water supply is subject to rapid changes from 'safe' to 'unsafe,' and it is not always possible to give warning of these changes. The purity of the water cannot be relied upon, and the water, therefore, cannot be classed as good from a sanitary standpoint."

At Cleveland, Dr. Howard, the city bacteriologist, is quoted as follows in his report to the health department:

"Dr. Howard says that the water 'cannot be called a good water, a safe water,' also that 90 per cent. of the intelligent people in fairly good financial circumstances do not drink it. He cites instances of prominent physicians who forbid their patients to drink it, and who, when typhoid is raging in the city, have at most only one or two cases. Mr. H. O. Way, assistant city bacteriologist, who under the supervision of Dr. Howard, made the bacteriological analyses of the water in 1905, states that the presence of the colon bacillus may be reasonably assumed as cause for classing the water as unsafe, it being understood that the word 'unsafe' does not necessarily always mean that the water is actually bad or unfit to drink. Similarly the absence of colon bacillus should fairly cause the water to be classed as 'safe,' although the water might possibly be bad without the colon bacillus being found in the particular sample examined. The general average, however, of all examinations indicates that the percentages of times the colon bacillus is found in the water may be fairly taken as the percentage of times that the water is unsafe. Mr. Way further states that observations of all the other local conditions affecting the water in Cleveland has borne out the statement that when the colon bacillus is found in the city supply, the water should be called unsafe. Mr. Way found the colon bacillus twelve times in 303 examinations of city water during 1905."

The following quotation is also made from Schedule III under question H 55:

"In view of all the foregoing facts and opinions, it would seem that the water is good almost all the time, but that its purity cannot always be relied upon, as it is subject on infrequent occasions to sudden changes from good

to bad. The water should, therefore, in the writer's opinion, be classed as fair."

At Syracuse, our investigator sums up this question as follows:

"Water is not only good from a sanitary standpoint, but is also remarkably soft, and for a lake water unusually free from color."

At Indianapolis, "the water supplied in 1905 was of good sanitary character," writes the inspecting engineer, who makes also the following comment on the character and efficiency of the filter plant:

"As indicated by the photographs (not reproduced here), the filter plant presents a very neat and attractive appearance. All of its appliances and accessories are strictly up to date, and the results obtained during 1905 after the filters had once been gotten into proper running order, were remarkably good, showing an average efficiency in the removal of bacteria of considerably over 99 per cent."

At New Haven, the following two extracts contain the conclusions drawn by our enginer regarding the quality of the water supplied:

"Writer did not see all records; was informed that colon bacillus was sometimes found in all the water, not excepting Lake Wintergreen, whose water is practically above suspicion; but that on all sheds, except Whitney, the colon was generally believed to come from animals, and therefore to be harmless."

"Water occasionally has slight color and taste from vegetable matters. From sanitary standpoint Lake Whitney water should be rated as fair during 1905. Waters from other four sheds, good."

The following extracts on this subject are taken from interviews had by our engineer:

Dr. Wright, president of the Board of Health—"Dr. Wright states that while the water sometimes had some color and taste from vegetable matter, he considers it was good from a sanitary standpoint in 1905, and that the water is not responsible for any of the typhoid at present. Finally the doctor says that in his opinion, the New Haven water supply, as a whole, compares very, very favorably with that of almost any other city."

Mr. Bailey, clerk of the Board of Health and secretary of the Union League Club—"The company takes extraordinary precautions to protect its source of supply, and that he believes its water is better than many of the peddled drinking waters. He attributes the rather widespread use of the latter partly to the scare resulting from the epidemic of 1901, partly to the color and taste which city water sometimes has, especially in spring time, from vegetable matter, and partly to active advertising on the

part of the sellers of bottled waters. He considers that the city water was pure from a sanitary standpoint in 1905."

Our investigating engineer also adds the following:

"As already stated, the typhoid rate in 1905 was somewhat higher than the average for the last few years. The writer of this report was not, however, able to find any competent evidence of the fact that the increase was due to the water supply. In view of all of the foregoing facts and opinions, the writer of this report would rate the quality of Lake Whitney water during 1905 as fair, and of that from the other four watersheds as good. Now that Lake Whitney water is filtered, all the water should, in the writer's opinion, be classed as good."

It is commonly assumed that the number of deaths from typhoid fever, in proportion to the population of the city, is an index to the purity of the water supplied. Undoubtedly there have been, and are, cases where pollution of the city water supply has caused an increase in the number of deaths, but it does not necessarily follow that a relatively high death rate by typhoid fever per capita is due to the quality of the water supply. Drinking water is not the only means by which this disease is spread. The figures taken from the report are as follows:

City.	*Population Taking Water from Mains.*	*Cases of Typhoid Fever Reported or Estimated.*	*No. of Deaths.*	*Deaths by Typhoid Fever per 100,000 Pop.*
Chicago	1,800,000	Not reported.	329	18.3
Cleveland	457,447	675	67	14.6
Syracuse	114,000	147	18	15.8
Indianapolis	120,000	412	71	59.2
New Haven.....	120,000	247	49	40.8

Taken at their face value, these figures show very unfavorably for the two cities where the water is supplied by companies, but it is evident that the investigating engineer does not believe that in either case the high number of deaths in these cities is due to the quality of the water supplied by the water companies. Regarding Indianapolis, I quote as follows from his answer to question H 158: "Interviews with members in the Indianapolis Board of Health as well as all that the writer was able to learn from other competent sources, corroborate the opinion that the water supplied in 1905 was of good, sanitary character."

"The president of the Board of Health stated that he had from time to time analyzed the water from about four thousand private wells in Indianapolis, and ordered closed 75 per cent. of all the wells that he had examined, but that the wells would soon be used again, as there was no law by which the board could enforce these orders. The president and secretary of the board both stated that they had tried for a long time to get an ordinance compelling the closing of cesspools, and the putting in of

connections to sewers, but that real estate men and property owners had always succeeded in defeating the ordinance. The city has a plumbing ordinance, but no plumbing inspector, and the Board of Health is said to have been unable to get one appointed because of the opposition of the master plumbers, who fear favoritism in the purchase of supplies."

The inspecting engineer adds the following:

"In view of the statements quoted above, it is the writer's opinion that a high typhoid fever death rate might naturally be anticipated, even with the purest possible city water supply."

Again in his answer to question H 166, there is a quotation from the report of an expert committee appointed by the city, and the company, which was made October 26, 1904:

"Page 31 of that report estimates that there are 25,000 private wells used more or less regularly for drinking purposes, showing that a majority of people get their drinking water from these sources, rather than buy the water furnished by the company. Page 29 furnishes further information, showing that after an existence of 38 years the people have not abandoned their wells. This report furnishes conclusive evidence that many of the citizens still cling to their wells without regard to sanitary conditions or convenience. Water so easily obtained as it is from the various veins makes severe competition for a water works, whether it be owned by the city or a private corporation."

In the case of New Haven, while the report states that the people depend for their supply of water mainly on the water furnished by the water company, as well water is not easily obtained in that city, yet it seems that the water is not to be blamed for the high number of cases of disease. Under Question H-55, the investigating engineer quotes from the interview with Dr. Wright, President of the Board of Health, as follows:

"A number of cases and five deaths occurred at the Almshouse, which is supplied from Lake Wintergreen, on whose watershed there was no possibility of pollution; and that he has had two outbreaks of typhoid this year directly traceable to milk. Dr. Wright states that while the water sometimes has some color and taste from vegetable matter, he considers it was good from a sanitary standpoint in 1905, and that the water is not responsible for any of the typhoid at present. Finally the doctor says that in his opinion the New Haven water supply as a whole compares very, very favorably with that of almost any other city."

In this connection I venture to quote again from Dr. Smith, the consulting chemist of the company: "Dr. Smith states further that the water has been better since

1901 than ever before; that the typhoid rate was higher than usual in 1905, but that he does not think that water was an important factor in the 1905 rate. Dr. Smith regards the water in 1905 as very good in sanitary quality."

The following is again quoted as the opinion of the investigator: "As already stated, the typhoid rate in 1905 was somewhat higher than the average for the last few years. The writer of this report was not, however, able to find any competent evidence of the fact that the increase was due to the water supply. In view of all the foregoing facts and opinions, the writer of this report would rate the purity of Lake Whitney water during 1905 as fair, and that from the other four watersheds as good. Now that the Lake Whitney water is filtered, all the water should, in the writer's opinion, be classed as good."

The conclusion drawn as a result of our investigation into the quality of the water, is that the water supplied by the two companies is good, sanitary water; that its quality is much better than the water supplied in Chicago; somewhat better than the water supplied in Cleveland, and quite as good as the water supplied at Syracuse. The latter place is blest with water from a source which, down to the date of this report, has remained pure without any special expense or effort on the part of the water department.

III. GENERAL.

Regarding the distributing systems of mains and services there is not much comment required. All of the cities use cast iron bell-and-spigot pipe, with lead joints, and in all cases the services are of extra strong lead pipe. In New Haven certain services are of wrought iron pipe.

Regarding the subject of meters, there is a certain number installed in all of the cities investigated, but Cleveland and Syracuse are the only cities where the meters are in large numbers. In Cleveland more than 68 per cent. of all of the services have meters on them, and in Syracuse more than 82 per cent. have meters. Under question H-64, the engineer gives an interesting account of the introduction of meters in Cleveland, and describes it as the "most notable act of the present administration." He commends the management for the introduction of meters, but criticizes the schedule of meter rates adopted as causing unjust discrimination, and as being unwise from the standpoint of good financial management. It seems that under these rates large profits are made on large consumers, while small consumers are supplied at a loss.

At Indianapolis, about one-third of the water supplied to consumers is metered, and at New Haven about one-quarter of the total supplied to consumers is metered.

Regarding the purchase of supplies, it is evident that the companies have greater freedom regarding contracts. In both Chicago and Cleveland, for any amount over $500, an ordinance by councils is needed and contracts must be advertised for two weeks. In Syracuse, the law provides that all purchases amounting to $50 or

over shall be let by contract to the lowest bidder, after advertising in at least two local papers. In some cases this law has been found to cause delay; also, in getting such supplies as hydrants and valves, the department has not been able to obtain the designs it wanted. The companies, of course, are not required to advertise for bids. In Chicago, there is an instance cited of a long delay due to slowness of councils. Certain improvements were recommended by the engineer in 1893, and were not provided until 1902, and even at the date of writing this report certain of these improvements were just being installed.

On the question of the location of offices for payment of bills, and for making complaints and leaving orders, it seems that Chicago and Cleveland are very poorly equipped, as the only office is in the City Hall. The office and shop in Cleveland are particularly poor. The office room for the public is practically a narrow corridor, with no conveniences for the waiting crowd. The shop has a few good tools, but is dark and poorly arranged and ventilated. Apparently the other cities have only one office for both purposes, but as they are smaller it is not so much open to criticism. Especially regarding the provision made for leakage or other complaints at night do the municipalities show in a relatively bad light. In the city of Chicago the only office of the water department is absolutely closed at night. The engineer says:

> "All offices in the City Hall except those of fire and police department are closed at night. Complaint would have to be made to the fire department office, which would try to telephone it to the district foreman."

At Cleveland and Syracuse, arrangements for night complaints are much more thorough, there being at Cleveland a night turn-off man to take care of ordinary complaints, while in the case of emergency the repair foremen are notified. At Syracuse, there is a man on duty at the office and two men with emergency wagons at the shop. At Indianapolis and New Haven, men are on duty all night with horse and wagon.

The replies to question H-137, regarding the office system of handling complaints, do not in all cases explain in sufficient detail to allow of a comparative judgment.

The impression obtained is that in the three municipal plants there is considerable "red tape" and a reference of different classes of complaints to the different departments, after which they are probably lost sight of by the office. It is true that at Cleveland it is stated that each complaint is recorded in the complaint book, and that the general foreman of repairs makes a written report on all repairs or investigations made by his force. At Syracuse, no complaint book is kept. Each complaint is supposed to be investigated by the division to which it belongs. Regarding the two companies, the system of recording complaints is not given. That the efficiency is high is shown by the fact that the policy is to bring the higher officers of the company into close touch with the consumer.

On the subject of telephones, Chicago again shows unfavorably. "Not all of the district foremen have resident 'phones as yet." The other two municipal plants and the two companies seem to be well provided.

Regarding attention to fires, apparently, none of the municipal plants has any system regarding its employees attending fires. This is true also of New Haven, while at Indianapolis there is a regular fire attendant employed by the company, as provided in contract with city, ready with vehicle to respond to all alarms.

The replies to question H-146, regarding the inspection that is maintained to prevent workmen of other companies or city departments from damaging water pipe or services, form an interesting exhibit of the manner in which companies excel municipalities in looking after their property. In the three municipal undertakings, the water department does not maintain any such inspection. In each case they depend on the local inspector of the street department for this purpose. Any one who has had dealings with the details of city government, knows how little interest the inspectors of the street department take in such a question as the protection of mains and services belonging to another city department. As a means of really protecting the mains and services, such an inspection is practically worthless. The two companies maintain systems of inspection by their own employees.

Regarding the inspection of consumers' premises for re-rating or for checking waste, the companies maintain the more efficient system. At Indianapolis, the inspection is made, as nearly as possible, once a year; at New Haven, probably twice a year; at Chicago, the territory is covered every two or three years; at Cleveland, such inspections have not been regularly made for some time. The entire city was inspected for re-rating in 1905. At Syracuse, such an inspection is not made at all, unless for special reason. An inspection for waste and unmetered services was made during the spring of 1905.

IV. RATES.

On account of the complicated systems of assessing water rates, it is difficult to make an accurate comparison. At each of the cities investigated, some water is sold on the basis of assessed rates and some on the basis of meter rates.

At Chicago, the water tax is based on a schedule of charges depending on the width and number of stories in the building. Additional charges are made for fixtures of all classes.

At Cleveland, there is a water tax for dwellings based on the number of rooms, with an additional charge for each bath and each toilet. Apparently, additional washstands, sinks or laundry tubs are included in the general tax. An attachment for sprinkling street or lawn, for a lot 66 feet or less in front, is free.

At Syracuse, the general rate is independent of the size of the house, being based on a faucet charge, which remains the same whether there be one or more faucets; additional charges are made for each bath, toilet and sprinkling attachment.

At Indianapolis, the water rate, like Cleveland's, is based on the number of rooms in the dwelling; additional charges are made for each bath, toilet and sprinkling attachment. The printed schedule of rates is based on an orifice in the main pipe not exceeding one-half inch diameter; each additional one-eighth of an inch in diameter of orifice increases the rate 10 per cent.

At New Haven, the water tax is independent of the size of the dwelling, or of the number of sinks or faucets maintained, provided the dwelling is occupied by one family. There is an additional charge for each bath, toilet, stationary washstand and sprinkling attachment.

In an effort to obtain an idea of the annual charges that result from the schedule here described, we have assumed two typical cases. First, a small residence, two stories, eight rooms, 25 foot front, with hot and cold water faucets in kitchen, and with one bath tub, one toilet and one washstand. In such a house the annual water charges show as follows:

	Chicago.	*Cleveland.*	*Syracuse.*	*Indianapolis.*	*New Haven*
General tax.....	8.50	5.50	7.00	7.00	5.00
Bath	3.00	2.00	4.00	3.00	3.00
Toilet	3.00	2.00	5.00	3.00	3.00
Washstand	1.00	....	....	....	.50
Total per annum.	15.50	9.50	16.00	13.00	11.50

NOTE.—Syracuse allows a 5 per cent. discount for prompt payment.

Second, a larger residence, three stories, sixteen rooms, 40 feet front, kitchen with hot and cold water faucets, two bathrooms, each having washstand and toilet, and one pave wash. For dwellings, the assessment will be as follows:

	Chicago.	*Cleveland.*	*Syracuse.*	*Indianapolis.*	*New Haven*
General tax.....	14.50	9.50	7.00	15.00	5.00
Bath	6.00	4.00	4.00	5.00	5.00
Toilet	6.00	4.00	6.00	5.00	5.00
Washstand	2.00	....	....	....	1.00
Pave wash	3.00	*Free	6.00	6.00	3.80
Total per annum.	31.50	17.50	23.00	31.00	19.80

Commenting on these tables, it seems that the citizen obtains the cheapest water in Cleveland, while New Haven is the second cheapest. At Indianapolis, the poor man gets water fairly cheap, but the cost increases rapidly as the class of dwelling improves. At both Chicago and Syracuse, the poor man sustains a relatively high expense for water.

We believe these figures form a favorable comparison for the two companies, each of which has been at the expense of bringing its water from a distance, of controlling, to a certain extent, its watershed, and of filtering a large portion of its supply; while two of the municipalities pump direct into the mains from an exhaustless supply near at hand, and the third, while conveying the water for some distance, is saved the expense of pumping.

*Lot 66 ft., or less in front, 5-8-inch connection, free.

The meter rates at each town, except Cleveland, are based on a schedule depending upon the quantity of water used; at Cleveland there is a flat rate for all quantities. Taking the highest figure, representing the smallest consumption in each city, we have:

	Per 1,000 *Gallons.*
Chicago	10c
Cleveland	5.33c
Syracuse	18.7c
Indianapolis	18c
New Haven	18c

Taken at their face value, these figures are somewhat misleading, as they do not take into account the graded reductions in prices for varying consumptions. For example, at Chicago the rate remains 10 cents for any monthly consumption under 165,000 gallons, while at Syracuse, as the consumption increases, the rate decreases by steps, so that for a consumption approaching 165,000 gallons per month, the Syracuse rate is only 8.7 cents per thousand gallons. Again at Indianapolis the 18-cent rate decreases by steps until, for a consumption of 165,000 gallons per month, it is only 8.25 cents per thousand gallons. At New Haven the rate drops to 10 cents per thousand gallons when a daily consumption of 3,000 gallons, say 90,000 gallons monthly, is reached, and remains at the same rate for all larger consumptions. At Cleveland the engineer devotes considerable space to a criticism of the meter rate, claiming that the water department loses money on small consumers and makes an unjust profit on large ones.

A list of minimum charges, which apply to the largest consumers, follows:

	Per 1,000 *Gallons.*
Chicago	4c
Cleveland	5.33c
Syracuse	4.7c
Indianapolis	4.5c
New Haven	10c

New Haven charges a meter rental of $1 per year for each 5-8-inch meter, with larger sizes in proportion; this is additional to the water rate. In most of the cities there is a minimum bill in connection with metered water.

CHAPTER VII.

FINANCIAL.

We have, in the previous chapters on Gas and Electric Light in Great Britain, made some brief reference to financial conditions. Owing to the municipalities having displayed the same adverseness to a close investigation of their affairs by our accountants—who were not given opportunity to determine from the original data that the

classification was what would in America be considered proper, and that all amounts properly chargeable against the operation of the undertakings had been included in the statements of the cities' auditors—which they displayed in connection with determinations of gas candle power by the experts or members of the Committee, we are unable to say just what electric current per kilowatt hour, and gas per thousand cubic feet, have cost the municipalities, or what profits they have made. At crucial points we had not the opportunity to verify. We have, however, seen in Parliamentary reports enough to indicate that the accountants of British municipal undertakings move in a mysterious way their wonders to perform, and to make us doubt the value of the statements they have presented. We are still able to make some valuable comparisons. We give below a statement of the profits, or losses, to the illuminating departments of the British cities investigated, assuming that they had sold gas or electricity at the same prices, and paid the same for coal per 1,000 c.f. or kilowatt as the companies investigated; we here accept all the municipal accountants' charges, credits and methods to be, as they claim by their use, proper and representative. For this purpose we take their own figures.

Reading the supplemental report of the engineers, we find therein a statement that the companies in general purchased to better advantage than municipalities. We know, from the reports of the experts, that the companies' plants were in general operated better than the plants of the municipalities. But ignoring these two facts, we still find that each municipality whose plant we investigated, if paying the same price for coal per 1,000 cubic feet of gas, as each of the companies (which assumption eliminates differences in price and gas producing properties of the coal), and charging the same price for gas as each of the companies, would, on its reported sales and on its own accounting records, have lost money on its operation in the year 1905, as set out below:

The Birmingham Municipal Gas Department sold M. C. F. of gas at 25.51d. per 1,000 cu. ft.		6,293,810
If it had sold this gas at the Sheffield Company's price, 17.36d., its income would have been reduced	£213,757	
If it had bought coal at Sheffield's cost per 1,000 cu. ft. gas made, its operating expenses would have been reduced	106,693	
If it had sold gas and bought coal at Sheffield's price and cost, its net income would have been reduced	107,064	
It claimed a profit of	51,526	
Therefore Birmingham's loss under the Sheffield Company's conditions would have been		£55,538
Similarly compared with the operations of the New Castle Company, Birmingham's loss would be shown as		15,982

Similarly compared with the operations of South Metropolitan Company, London, its loss would be shown as £20,628

Similarly comparing—

Leicester Municipal Undertaking with Sheffield Company shows a loss to Leicester of..... 16,033

Leicester Municipal Undertaking with South Metropolitan Company (London) shows a loss to Leicester of..... 5,520

Leicester Municipal Undertaking with New Castle Company shows a loss to Leicester of..... 4,358

Glasgow Municipal Undertaking with Sheffield Company shows a loss of..... 47,266

Glasgow Municipal Undertaking with South Metropolitan Company (London) shows a loss of 19,019

Glasgow Municipal Undertaking with New Castle Company shows a loss of..... 11,741

Manchester Municipal Undertaking with Sheffield Company shows a loss of..... 59,100

Manchester Municipal Undertaking with South Metropolitan Company (London) shows a loss of 29,902

Manchester Municipal Undertaking with New Castle Company shows a loss of..... 27,935

This may be more briefly stated thus:

Birmingham, sales at Newcastle's gas rates and coal costs per 1,000 C. F., would have lost..... 15,982

Birmingham, sales at Sheffield's gas rates and coal costs per 1,000 C. F., would have lost..... 55,538

Birmingham, sales at London's gas rates and coal costs per 1,000 C. F., would have lost..... 20,628

Leicester, sales at Newcastle's gas rate and coal costs per 1,000 C. F., would have lost..... 4,358

Leicester, sales at Sheffield's gas rates and coal costs per 1,000 C. F., would have lost..... 16,033

Leicester, sales at London's gas rates and coal costs per 1,000 C. F., would have lost..... 5,520

Glasgow, sales at Newcastle's gas rates and coal costs per 1,000 C. F., would have lost..... 11,741

Glasgow, sales at Sheffield's gas rates and coal costs per 1,000 C. F., would have lost..... 47,266

Glasgow, sales at London's gas rates and coal costs per 1,000 C. F., would have lost..... 19,019

Manchester, sales at Newcastle's gas rates and coal costs per 1,000 C. F., would have lost..... 27,935

Manchester, sales at Sheffield's gas rates and coal costs per 1,000 C. F., would have lost..... 59,100

Manchester, sales at London's gas rates and coal costs per 1,000 C. F., would have lost..... 29,902

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Leicester, sales at Sheffield's gas rates and coal costs per 1,000 C. F., would have lost	16,033
Leicester, sales at London's gas rates and coal costs per 1,000 C. F., would have lost	5,520
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Glasgow, sales at Sheffield's gas rates and coal costs per 1,000 C. F., would have lost	47,266
Glasgow, sales at London's gas rates and coal costs per 1,000 C. F., would have lost	19,019
Manchester, sales at Newcastle's gas rates and coal costs per 1,000 C. F., would have lost	27,935
Manchester, sales at Sheffield's gas rates and coal costs per 1,000 C. F., would have lost	59,100
Manchester, sales at London's gas rates and coal costs per 1,000 C. F., would have lost	29,902

The selling price of the most important residual—coke—has no influence on this part of our problem, except as indicating the character of management, for it will naturally, other things being equal, follow the price of its competitor—coal.

The factors beyond the control of the management, and having the greatest influence on the difference in the cost of making gas in the British cities, as far as our investigation develops, are that part of the cost of coal per ton due to location of plant (freight differences) and the gas producing quality of coal. We have been able, as given above, to make a comparison in which this difference in the cost of coal per ton, and in the amount of gas produced per ton of coal has no effect, and which shows each municipality to yield results far inferior to the results of each company. Such a comparison enables us also to make the following additional statement, fairly comparing each municipality with the company having the lowest priced gas:

The Birmingham municipality claimed £51,526 net profits from the operation of its gas works in the year 1905, after putting into its sinking fund £37,584. If it had sold its gas at the prices charged by the Sheffield company, and had the advantage of Sheffield's coal costs per thousand cubic feet of gas made, it would have made no profits, put nothing into its sinking fund, and have lost £17,954 by the year's operations.

Leicester claimed £43,467 net profits from the operation of its gas works in the year 1905, and put into its sinking fund £14,527. If Leicester had sold gas at Sheffield's prices, and had the advantage of Sheffield's coal costs per thousand cubic feet of gas made, it would have made no profit, put nothing into its sinking fund, and have lost £1,506.

Glasgow admits a loss of £12,055 from the operation of its gas works in the year 1905, and put into its sinking fund £31,734. If Glasgow had sold its gas at Sheffield's prices, and had the advantage of Sheffield's coal costs per thousand cubic feet of gas made, it would have made no profit, put nothing into its sinking fund, and would have lost £15,532.

Manchester claimed a net profit of £61,614 from the operation of its gas works in the year 1905, and put into its sinking fund £43,814. If Manchester had sold gas at Sheffield's prices, and had the advantage of Sheffield's coal costs per thousand cubic feet of gas made, it would have made no profit, put nothing into its sinking fund, and have lost £15,286.

It may be claimed that the differences in labor costs should be included in these comparisons, and we now study their effect on our figures. It is to be remembered that Sheffield is, with the exception of Leicester, the smallest city investigated, and has the smallest sales of gas. Therefore, the municipalities should have been able, with equal efficiency in management, and at Sheffield's prices for gas and cost of coal and labor, to have produced results at least equal to those produced in Sheffield; and we are, therefore, compelled to charge the loss they would have sustained under

Sheffield's conditions to mistakes in design and policy and inefficiency in management, or to overcapitalization, each as compared with Sheffield. The differences in labor costs are due to differences in local labor rates and in operating efficiency. They are referred to here simply to avoid the possible criticism that the prices paid labor might have had an effect in so increasing the cost of gas to consumers as to nullify the force of our comparison. Had we included in these comparisons the differences in labor costs per thousand cubic feet of gas made, as far as we find them set out in the schedules—which differences are due in part to differences in rates of wages, and, in greater part, to differences in efficiency of plant and operation—we would have had the actual losses sustained by these municipalities at Sheffield's prices of gas and costs of coal and labor:

	£
Birmingham	47,060
Leicester	15,629
Glasgow	19,998
Manchester	34,790

—and of them only Manchester and Glasgow (like the other municipalities, making no profit) could have put anything into their sinking funds. Manchester could have put into this fund only £9,024, showing no profit, though it claims a sinking fund and profit combined of £105,428, and Glasgow could have put into this fund £11,736, though it claims a sinking fund of £31,734 and admits a loss of £12,055.

Birmingham would not have earned any profit, and would not have come within £9,476 of being able to put one penny into its sinking fund.

Leicester would not have earned any profit, and would not have come within £1,102 of being able to put one penny into its sinking fund.

In view of these facts, it is profitless to discuss the accounting vagaries of municipalities and the questionable character of the security of their sinking fund investments. Had they dealt as liberally with their consumers as the companies dealt with theirs, there would have been no sinking funds worth quarreling about.

By the same methods of comparison, we find that if the municipal electric lighting plants investigated had been paying the same price for coal per K. W. hour of electricity produced as the two Newcastle companies combined (which again eliminates all questions of cost per ton and heating quality), and had charged the same price for electricity as the two Newcastle companies combined (with which alone they are comparable, as shown in the chapter on British Electric Undertakings), they would have lost money on their operations in the year 1905, and the losses would have been as follows:

	£
Manchester	135,709
Liverpool	53,496
Glasgow	96,206

This shows losses sufficient to wipe out the entire 1905 sinking funds, and, in addition, all interest and charges to the following amounts:

	£
Manchester	76,516
Liverpool	11,018
Glasgow	80,731

If these municipalities were to charge company prices for gas and electricity, and were to buy their coal at company cost per unit of product, some of them would be in immediate danger of insolvency.

The facts presented above, taken in connection with the demonstrated poor character of service rendered by the British municipalities, leave them nothing to claim of legitimate financial advantage from their operation of their gas works or electric plants, and give the consumer, who is compelled to buy his illuminant from the city, much cause for complaint.

The financial treatment of the American municipal undertakings investigated is very simple. The Wheeling gas undertaking shows an apparent profit of about $25,000, to which should be added charges for gas supplied to city departments and hospitals, and for gas used at plant and offices, for which the municipality has failed to charge; this would increase the apparent profit to about $28,500. From this profit should be deducted charges which have not been included in the city's statement of operation of the gas department, but which have been charged into general accounts. These items consist of various charges, among which are depreciation on plant of $11,500, as estimated by Marwick, Mitchell & Co. (Commission's experts), taxes, $5,000, interest on investment as figured on the engineers' valuation of the plant, $19,500, etc. These amount in all to about $45,000. Including these items in the operating account would reduce the apparent profit to a deficit amounting to $16,500.

A brief discussion of the effect of municipal operation of gas works on the finances of Philadelphia is included in the chapter American Gas Undertakings.

The Chicago water department has expended on its pumping stations, distributing system, etc., according to the report of the experts, $32,739,171. Representing this, according to Mr. Maury, the water expert of the Commission, is a plant having an appraised value, December 31, 1905, of $29,874,762. The sanitary canal and intercepting sewers have cost $54,719,000 up to the same date, and by the same authority.

Mr. Maury says, further: "The writer believes that between 80 and 90 per cent. of the cost of these two works is fairly chargeable to the purification of Chicago's water supply. Assuming $45,000,000 as the expense incurred for this purpose, the interest charged at 4 per cent. would amount to $1,800,000 per annum. The writer is unable to state what would be a proper allowance for taxes and operating expenses on the above proportion of these two

works. The taxes that would have to be paid on the Chicago water works plant, assuming that it was owned and operated by a private corporation, have been estimated by the expert accountants for the Commission at about $420,360. The same accountants have also estimated that a fair annual charge for fire insurance, boiler insurance and employers' insurance for the water works plant would be $60,285."

If a fair tax on the $29,874,762 would amount to $420,360, the taxes on the $45,000,000 expended for the drainage canal, plus its operating cost would not be less. Adding this item of $420,000, which has not been included in the statement of the Chicago water works; 4 per cent. interest on the $45,000,000 expense on the drainage system for the improvement of the water supply; 4 per cent. interest on the appraised value of the plant, amounting to $29,874,762; and the estimated charge for fire, boiler and liability insurance of $60,285, gives as a proper charge against the water supply of Chicago, and not included in the statement, of $3,475,635. If these charges had been made against the water works department in the year 1905, the water works' apparent profit of $1,801,570 would be converted into a deficit of $1,674,065.

Chicago Water Works.

Profit from operation, as per report of Messrs, Marwick, Mitchell & Co		$1,801,570
Interest on appraised value of plant, $29,874,762, at 4 per cent	$1,194,990	
Interest on proportion of cost of drainage canal and intercepting sewers, built for the purpose of protecting Chicago's water supply, and considered in experts' reports as a proper charge against the City of Chicago's water department; to at least 80 per cent. of its cost, say $45,000,000. Interest on $45,000,000, at 4 per cent	1,800,000	
Add to these charges, taxes on the value of the drainage canal and cost of operating the same, including depreciation, at the same figure as the tax estimate by accountants on water works proper, at, say	420,360	
Also estimated premiums on fire insurance, boiler insurance and liability insurance of water works plant	60,285	
		$3,475,635
Deficit, after taking up above charges		$1,674,065

Cleveland Water Works.

The Cleveland water works department shows apparent net earnings		$226,153
Interest on bonds, at 4 per cent.	$145,947	
Extraordinary expenses	19,020	
		164,967
Leaving true profit, as shown by Messrs. Marwick, Mitchell & Co.		$61,186
If we charge the undertaking with the interest and depreciation on 80 per cent. of the cost of the intercepting sewers so far as completed, January 1, 1906, $1,200,000, as the expert advises is reasonable, we have a charge of 6 per cent. for interest and depreciation on $1,200,000		72,000
Leaving a net loss on 1905 operation of		$10,814

The completion of these sewers will cost $3,000,000 more. They were unanimously recommended by a public commission ten years ago. Had they been built as the expert says they should have been, Cleveland would probably have had better water in 1905, and would surely have had 6 per cent. on $2,400,000, or $144,000 to add to the loss of its water works department—$10,814—as above. The deficit then would have been $154,814, less whatever could have been earned on increased sales, due to increased confidence in the character of the water.

Syracuse Water Works.

The Syracuse water department made an apparent profit in 1905 of $31,515. This as the result of operating a gravity system, without pumping or filtration charges, with little expenditure for protecting its watershed, and with prices to small householders nearly 20 per cent. in excess of the charges by the companies investigated (both operating pumps, and one operating filter, and under the necessity of protecting and patrolling a watershed), and prices to large householders 15 per cent. higher than the New Haven Company charges.

If American water works experience is to justify municipal ownership of the water supply, it must be the experiences of undertakings not investigated by this Commission.

Allegheny Electric Lighting.

It is possible to apportion the costs of operating this municipal plant between the arc and incandescent lamps with an approach to accuracy. The accountants tell us the total cost of producing the current is $76,195. The engineers say that three-fourths of the current generated was used in the 1,522 arc lamps. If we divide total costs on this proportion, we get a cost of $57,146 for the production of the current consumed by the arc lamps. To this must be added:

Wages on Arcs	$9,444.00
Three-fourths General Distribution	1,319.00
Repairs Overhead Lines	10,424.00
Street Lamps	3,391.00
Three-fourths Miscellaneous	900.00
Three-fourths General Expense	3,243.00
Three-fourths Taxes and Depreciation	29,266.00
Three-fourths Fire Loss (Less Insurance), and Other Profit and Loss Items	3,450.00
	$61,437.00
Add Cost of Current	57,146.00
Total Cost of 1,522 Arcs	$118,583.00

—or $78 per arc per year, without interest. The bonds issued and outstanding, plus the notes outstanding, = $424,000. The interest charge at 4% = $16,960. Three-fourths of $16,960 = $12,720, or $8.36 per arc lamp. Making the total cost per arc lamp per annum in this cheap coal territory $86.36.

Chicago Electric Lighting.

The accountants of the Commission show the Chicago municipal arcs to have cost, including interest, $100.06 each in 1905. We further discuss this question under American Electric Undertakings, showing there that the loss to the city from its electric venture has been $164,921.96, as reported by the accountants.

Detroit Electric Lighting.

The 1905 operating expenses of the Detroit municipal plant were	$194,364.00
81 per cent. of the current generated was used in arc lighting; the total expenses, divided in this proportion, as seems reasonable, give cost of 3,025 arc lamps	157,435.00
or, per lamp (without interest)	$52.04
Interest is not given, but is reasonably	10.00
Making the cost per lamp	$62.04

This cost is in reality not low, considering the low cost of coal, and considering that the lamps are "dimmed" at 9 o'clock every night probably to not more than three-fourths of their normal candle power, and burn several hundred hours less than what is considered a full schedule.

South Norwalk Electric.

In the examination of South Norwalk's account it is impossible to separate the public street lighting from the commercial business, so as accurately to determine the exact cost per arc lamp per year. In the report of the accountants, Schedule IV., we find that there

are omissions in the operating charges, of $350 for water, $130 for general expense, $968.50 for taxes and $7,000 for depreciation, making a total operating cost of $28,689.75, instead of $20,241.25; which leaves the plant showing a profit on the combined business of $6,725.96 before charging interest on investment. Adding to these figures interest on appraised value, $82,739, at 4% = $3,309, makes the total cost of operating $31,999, or 38 per cent. greater than the total cost shown by the municipality's report.

According to South Norwalk's accounting, the cost of its street lights is figured at $60 per lamp per year. These lamps are operated, as shown by the engineers, for only 2,422 hours per year, or only 60 per cent. of a full, all-night-and-every-night lighting period; this gives a proportionately cheaper service when compared with a full hour lighting service. The reports also show that these lamps are only 375 watts, and hence produce a proportionately less amount of light than that of the regular 500-watt lamp, and must be considered, on this basis, to be less than half the value of a full watt full hour lamp.

The value of the plant shown on the books amounts to $116,944.90. The appraised value of the engineers is $82,739.63, showing a discrepancy in value of the assets of $34,205.27. The accountants, in their statements, have reduced the reported surplus of the plant of $35,695.08 by this difference, leaving a true surplus of $830.19, which represents the total profit since the beginning of the operation by the municipality.

In view of the above there appears no good reason to discuss at length the effect of municipal ownership on the finances of a city. That the debts of British cities have been enormously increased by municipalization is admitted by its apologists. They claim the increase in debt to be represented by valuable assets—public service plants. We have shown the effect on the finances of citizens, and on their comfort and prosperity, of the operation of these plants. We venture to believe that the loss to the communities whose municipal industries we have investigated, from bad management and lack of enterprise, resulting in restricted service of modern utilities, is many times the profit these cities falsely claim to have realized from their Rip Van Winkle methods of serving the public.

The effect on a city's finances is a component of profit (if any) earned by the municipal operation, and the increase in prosperity and values in the community due to better facilities offered the people. We have been able to demonstrate the futility of claiming that such a component would be a positive quantity. High prices, poor quality, worse service, have resulted in an opportunity to claim a profit that can be shown in dollars and cents. Analysis wipes out the profit by comparison with such a price as a company would give, coal prices being equalized, leaving some loss in cash and a check on progress, as the net result of municipal as compared with company ownership of gas and electric plants in Great Britain.

It is not worth while to discuss the effect on the finances of American cities of the municipal operations of the industries that

we have here investigated. Properly audited they have, with one or two exceptions, lost money, and their plants are all inadequate to good service, and have, with the exception of the water plants, little more than a scrap value, in view of the present state of the arts. What effect can such poor efforts as we have witnessed have on public wealth or public comfort? It cannot fail to be bad.

CHAPTER VIII.

A MOVEMENT ALREADY THREE-FOURTHS DEAD.

The wave of pseudo-socialism and municipalization that threatened to submerge Great Britain, and did sweep over many of its cities, is fast subsiding, as this Committee found reason to believe and as the recent London and Borough elections clearly prove.

Many men who believed themselves consistent and thorough Socialists, and others who believed in municipalization, both as a remedy for social ills and a community health food, lately argued for a clean sweep of all sorts of productive industries into the scope of city administration. But this extreme element now has little strength, either in America or Britain. In our own Boston we had a municipal printing office set up, soon to become an object of investigation and remain an example of what was not to be followed in other American cities. This class of propositions has been sent to the junk pile of impossibilities, and it is safe to say that London will hesitate long ere it considers another project like the municipal Thames steamboat service, which has lost $500 or more every day that it has been in operation.

In other directions the proposed area for municipalization has shrunk. For a time the limits of the manufacture and supply advocated to be carried on by the various municipal undertakings were wide and uncertain. For example, the supporters of a regime of officialdom once called for the manufacturing of every possible part of the equipment of municipal tramways. Some tramway council committees build their own cars and turn out much of their own iron and brass work. Experience brands this practice, for the little 100-mile systems of the great British municipalities, an economic absurdity. In general, British cities have halted far short of the limit once suggested even by the more sober municipalizers for the self-contained municipality. It is a matter of knowledge, alike to the Commission's experts and its Committeemen, that without exception the managers of the British gas, tramway, and electricity undertakings who were interviewed, held off from recommending any extension of municipal activity in what they termed "trading."

Time has demonstrated the fallacy of a municipal telephone service, such as was heralded in Glasgow as a fitting complement to its other "public functions." That project has gone to the wall, and carried city funds with it. No other like it will be set up in Britain. It has been out-argued by events.

The changing character of the discussion of municipal ownership becomes clear when the searcher for truth looks over some of

the pretentious treatises on municipal monopolies issued eight or ten or more years ago by ardent advocates of thorough municipalization. Consciousness of literary ability led, where consciousness of operating ignorance should have warned. Many an assertion was made by able but misinformed writers at that period, that cannot be repeated now.

What, for instance, to take up the question from the standpoint of American experience, may now be said of the Wheeling gas works, which they have heretofore so highly commended? What credence can now be attached to the flattering statements of the costs of public lighting in Chicago and Detroit, and of the municipal operation of the Philadelphia gas works?

Would the authors now allege what they then asserted, to support their thesis of municipalization? Have they any new facts, alleged or substantiated, on which to support their theories? If not, why, when they are driven, step by step, to recede from positions once taken in error, do they persist in arguing for their principles, thus proved to be unsound in many particulars?

Whatever the subjective relation of municipalizers to their reform, their objective relation, as we have seen, is far from what it once was regarding the commodities and services to be municipalized. They have been obliged, by the logic of events, to cut away from much that seemed precious to themselves and to many who trained with them. Their opponents, taking cognizance of the projects abandoned, hoped that now municipalizers might be pinned down to the consideration of ascertained facts relating to undertakings which their representatives have had an opportunity to visit, and to developments obvious to all who are interested in the progress of the debate on the question. The voluntary movement of the municipalizers to this not easily shiftable point would, we submit, in itself have been a contribution to the cause of truth and a source of gratification to their adversaries. But the radical British municipalizer has exhibited the resources of hope and fancy, if not of logic and consistency. While his American comrade is still shouting for municipal ownership, he is to-day, in his latest frame of mind, looking expectantly to "municipalization by provinces." That is, for gas, water, tramways and electricity he now wants national government, appropriation, ownership and operation. He has dropped municipalism, and comes out for what he all the time had in the background of his thought—socialism. Fabian Tract No. 125, "The New Heptarchy Series No. 1," finds "the question of area becomes of permanent importance." "The town council unit as a tramway area is obviously inadequate in the crowded centres of the North; the county council area although less open to objection, would not be wholly satisfactory." "Transit, water and electricity should not become county but provincial services." "In the course of time it will be found possible to carry the development a stage further, and from provincial boards to elect national boards." "A national board might be empowered to carry on the work of building rolling stock by direct employ-

ment in its own work shops for the whole of the publicly owned transit services of the country. It might also start factories for the manufacture of tramway rails and motor cars. It could undertake the work of constructing plants of all kinds for publicly owned electric light and power installations."

Thus the familiar old song of state socialism is paraphrased. The principle was accepted by leading municipalizers of Great Britain who appeared before our Commission in London, and it is the logical outcome of municipalization.

When ex-Mayor Dunne of Chicago came out last summer for twenty-year franchises for the street car corporations of his city, he demolished his platform, ignored his campaign principles, and returned to the system of private ownership in the one industry whose reform through municipalization was the loudest cry that gave him his office.

The writers have, since the beginning of this investigation, made a list of about 70 cities and towns in America that, having tried municipal ownership and operation of gas, electric or water plants, are reported to have closed their properties or sold or leased them to companies or individuals, as follows:

City.	*Gas or Electric.*
Alexandria, Va	Electric.
Anderson, Ind	Natural Gas.
Atalla, Ala	Electric.
Audobon, Ia	Electric.
Ballard, Wash	Electric.
Berkeley, Cal	Electric.
Beverly, O	Electric.
Brunswick, Mo	Electric.
Bowling Green, O	Natural Gas.
Carrolton, Ga	Electric.
Casselton, N. D	Electric.
Chehalis, Wash	Electric.
Council Grove, Kan	Electric.
Dayton, Tenn	Electric.
Dunkirk, Ind	Electric.
East Chicago, Ill	Electric.
East Grand Forks, Minn	Electric.
Eldorado, Ill	Electric.
Elgin, Ill	Electric.
Emmons, Pa	Electric.
English, Ind	Electric.
Findlay, O	Natural Gas.
Fostoria, O	Electric.
Frankfort, N. Y	Gas and Electric.
Fredonia, N. Y	Electric.
Gravesend, N. Y	Electric.
Greenville, S. C	Electric.
Hamilton, O	Gas.
Harvard, Ill	Electric.

City.	*Gas or Electric.*
Herrington, Kan.	Electric.
Hudson, Wis.	Electric.
Itasca, Tex.	Electric.
Jonesboro, Ind.	Electric.
Lagrange, Ill.	Electric.
Lakewood, O.	Electric.
Leon, Iowa.	Electric.
Leroy, N. Y.	Electric.
Linton, Ind.	Electric.
Madison, Ind.	Electric.
Marceline, Mo.	Electric.
Mentone, Ind.	Electric.
Michigan City, Ind.	Electric.
Middletown, O.	Electric.
Mohawk, N. Y.	Electric.
Moline, Ill.	Electric.
Monroe, Mich.	Electric.
Montpelier, O.	Electric.
Mooresville, Ind.	Electric and Water.
Muncie, Ind.	Electric.
Northfield, Vt.	Electric.
Philadelphia, Pa.	Gas.
Pittsfield, Ill.	Electric.
Portland, Ore.	Electric.
Portsmouth, O.	Electric.
Pullman, Wash.	Electric.
Siloam Springs, Ark.	Electric.
Stockton, Kan.	Electric and Water
Sycamore, Ill.	Electric.
Tipton, Ia.	Electric.
Toledo, O.	Gas.
Vancouver, Wash.	Electric.
Wabash, Ind.	Electric.
Waddington, N. Y.	Electric.
West Seattle, Wash.	Street Railway and Water.
Wilmington, O.	Electric.
Wytheville, Va.	Electric.
Xenia, O.	Electric.

They have found also over 50 cities and towns in trouble with their municipal plants; some advertising them for lease or sale; and many discussing the wisdom of abandoning or otherwise disposing of them; and about the same number that have lately considered municipal ownership and decided against it. Personal investigation of a large proportion of the instances proves each of the investigated instances properly quoted. We claim, not that there are no errors in the lists, but that there are few, if any.

Ten years ago there were many prominent citizens of Philadelphia advocating the continuance of the municipal operation of

the city gas works. One of the best known citizens of Philadelphia and an honored member of the press of that city recently told Professor Bemis and the writers of this analysis that he knew not one prominent citizen of the town who was now in favor of municipal operation.

We submit as a conclusion that the inquiry of our Committee, both from the standpoint of British and American experience, has shown that where municipal ownership has been removed from the realm of philosophic discussion and put to the test of actual experience, it has failed ingloriously.

The few enthusiasts who still advocate it will soon be convinced by the logic of events, and, turning their energies to other things, will through them realize their ambitions of usefulness to their fellows.

CHAPTER IX.

MUNICIPALIZATION VS. REGULATION.

One fact of positive value stands out clearly in the general outcome of this investigation—each side is enabled to make its alleged remedial propositions plain.

The members of our Committee, who remain municipalizers, with many of their fellow partisans, appear to have cut away, at least temporarily, from the extreme State Socialists and even from other clans of municipal reformers. They appear to advocate, for the present, only the municipalization of the industries that necessitate in their operation a fixed and exclusive possession of the highways—as gas, water, electricity and street railways. At least the emphasis and body of their argument now bear on these industries; any other they might possibly take up with, are left in the misty background, topics for the harangues of the more incautious and unscientific. They are not adherents of the British Labor Party, lately rushing pell mell to swallow the indigestible mass of Socialistic planks that have heretofore carried Labor parties of the United States to ruin. They might, of course, regard the transition of electric power and lighting to larger areas with a sentiment akin to support of State Socialism in these respects. But they have elected to stand on the ground on which they feel strongest.

The opponents of municipal (or State) ownership and operation, themselves by no means ultra-conservatives, have also their prevention for possible abuse of a monopoly of the use of the highways in a particular industry. Their proposition differs radically from that of the municipalizers in political, economic and moral standards. They would have franchises, contract and regulation remain the irremovable bases for all public work in the performance of which exclusive occupancy of the highway presents the leading social problem. They would have the community prescribe—sharply, clearly, and fully—private operation, without granting monopolistic powers in fixing prices or otherwise. They are convinced that a community can so define the best conditions for the operation of each of its industries that requires a franchise, that

City.	*Gas or Electric.*
Herrington, Kan.	Electric.
Hudson, Wis.	Electric.
Itasca, Tex.	Electric.
Jonesboro, Ind.	Electric.
Lagrange, Ill.	Electric.
Lakewood, O.	Electric.
Leon, Iowa.	Electric.
Leroy, N. Y.	Electric.
Linton, Ind.	Electric.
Madison, Ind.	Electric.
Marceline, Mo.	Electric.
Mentone, Ind.	Electric.
Michigan City, Ind.	Electric.
Middletown, O.	Electric.
Mohawk, N. Y.	Electric.
Moline, Ill.	Electric.
Monroe, Mich.	Electric.
Montpelier, O.	Electric.
Mooresville, Ind.	Electric and Water.
Muncie, Ind.	Electric.
Northfield, Vt.	Electric.
Philadelphia, Pa.	Gas.
Pittsfield, Ill.	Electric.
Portland, Ore.	Electric.
Portsmouth, O.	Electric.
Pullman, Wash.	Electric.
Siloam Springs, Ark.	Electric.
Stockton, Kan.	Electric and Water
Sycamore, Ill.	Electric.
Tipton, Ia.	Electric.
Toledo, O.	Gas.
Vancouver, Wash.	Electric.
Wabash, Ind.	Electric.
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both the community and the franchise holders would achieve the recognized benefits of free industry, while leaving the management in a position favorable to unimpeded initiative in conducting its business. Any community in America can command the eager services of abundant capital if it will offer—1. Current interest on investment in the working property of an enterprise. 2. Wages of superintendence and labor. 3. Compensation for risk in initiation and maintenance. 4. Fair yield from the increase of business, or economy of operation, arising from energy in administration and improvements in methods and machines. 5. Preservation of that due regard for vested interests necessary for an established confidence in the rectitude and integrity of organized authority.

Manager and investor must have guarantee that where they have sown they may reap. This assured, the consequent gains to society would be everything promised but never yet realized by the municipalizers, together with higher financial results, both to the community and the consumer; a firmer foundation for the State; a far better protection of the rights and enjoyments of all its citizens, and the conservation of the energies of the world.

In outline, the promises of the municipalizers are: 1. Prevention of the predatory processes of the money power. 2. Economy in operation. 3. The enterprises public property, free of debt, with no call for dividends within a period of greater or lesser duration. 4. A better lot for labor.

On the first two of these points Professor Parsons (Municipal Affairs, No. 24, page 696) has these affirmations: "Public ownership has no lobby expenses or legislative fund to provide for; nor any dividends on watered stock to pay; nor overgrown salaries or monopolistic profits; nor litigation expenses and lawyers' fees; it saves on interest and insurance; it gains through the co-ordination of services, and through the civic interest of the people in their own plant, and the higher efficiency of better paid and more contented labor; it would save the cost of endless investigations into the secrets of private monopoly; it would diminish the cost of legislation, for a large part of the time and attention of our legislators and councilmen is given to the private monopolies." As to the third point, Baillie Alexander, of Glasgow, addressing our Committee avowed his conviction that in one respect municipal operation was incontestably superior to private—it would in time give the community the works operated, with its debts paid, and its future expenses only the operating costs.

Taking up with these various claims in their order, we herewith give in outline, as our small space requires, with a minimum or argument, our conclusions and counter-claims.

In Great Britain "lobby expenses" for municipalities exist. They are represented by Parliamentary agents' fees, shared at times with the town clerk of the municipality petitioning for powers. It is in the nature of combinations of officeholders to have bosses, and here is an illustration of lobbying by bosses. In America, company lobby expenses may or may not be the fees of lawyers retained by

corporations to defend themselves against legislative strikers. Whether engaged for this purpose or for obtaining unfair privileges, the lobbyist is a character whose employment all citizens may well unite in rendering superfluous, and this is done with respect to public service companies by placing them under just, efficient, and systematic regulation.

Public ownership could not prevent municipalities from being parties to lawsuits relating to damages, either to property or to persons, or negotiations with contractors or other municipalities. The desirable lessening of litigation need not await municipalization.

The margin between the interest paid by English municipalities and private concerns has been narrowing within recent years, since the enormous increase in municipal indebtedness. Give a company the perpetual and exclusive franchise enjoyed by the municipality, with reasonable protection and regulation, and its bonds will sell as well as the bonds of the city for money borrowed on plant and franchise.

"Co-ordination of services," of brilliant promise in theory, dwindles away in practice with the development of red tape, with restrictions in the allotment of annual appropriations, with the disjointure of succeeding administrations pursuing antagonistic policies, and with the substitution of rigid statutory procedure for the elastic methods of private work. Our Committee heard complaints of this in Great Britain. Co-ordination between local governments and the general business agencies of society in the adoption of new ideas, processes and machinery is deficient. Co-ordination between city departments is glaringly at fault in large American and British cities. Separate departments may be under different political parties, pursuing policies at cross purposes. One department may regard certain statutes as obsolete, while others hold them as operative. Courts lag years behind in deciding cases which hold back sheriff, commissioner or mayor from carrying out their duties. Necessary public improvements of the first magnitude may stand still from one administration to another, awaiting the legal untying of conflicts between officials of different ranks or departments. Streets are torn up by orders of one city department immediately after they have been paved by another, and they long remain unpaved or in disrepair for lack of orders from the proper bureau. One set of magistrates by their decisions may paralyze the work of the Police and Health Departments, while their confreres on the bench later issue counter writs. It is a politician's proverb that what is thrown into litigation is dead for a long time. The Law Department co-ordinates with not one other thing of city government. And within a single department the lack of co-ordination is such that even in Britain, managers and councilmen quite uniformly told our Committeemen that the labor on public work cost more than that on private. The erection of a public building, or the construction of a bridge, or the completion of any great public enterprise commonly requires months or years longer than to

perform private works of equal importance. Efficiency is the product of a speedy adoption of plans, a freedom in the purchase or rejection of equipment, a continuity of policy, a certainty in the engagement of needed talent, an equal certainty in the disengagement of supernumerary or unadaptable elements in an administrative or operating force, together with mobility of organization or disorganization of an entire corps or any of its parts. The efficiency of a private company is unattainable under civil service of public employees, adjustment to hard and fast law by a committee, and the restrictions to managerial control exerted by public servants. The system of annual appropriations to the several departments of a city of itself breaks the factor of co-ordination between two periods of more than twelve months in duration. The necessity of taking financial care of all the departments under an annual tax levy frequently robs a most deserving department of its necessary sustenance. The refusal of a municipal official to take on himself a responsibility not specially authorized by the letter of the law is defensible, where, in the case of a company official of the same rank, it would be unpardonable. The manifold restraints imposed by bureaucratic rules are alone sufficient to prevent a high degree of co-ordination in any public service. In this connection, Professor Rowe's strictures on the councilmanic management of the Philadelphia Gas Works are pertinent.

With regard to what common property is now held by municipalities, "the civic interest of the people in their own plant" is sadly at fault. In the United States it may be set down as a general truth that, in our community life, all the public features are far in the rear of the private. Court houses, city halls, State capitols, post offices, almost invariably cost excessively as compared with private buildings of the same class, the appropriations for their maintenance run annually far beyond what is paid for similar purposes in the ordinary course of business, and their usual conditions as to convenience, cleanliness, order and state of repair, and the behavior both of their employees and callers on business are below non-governmental standards. The public spirit that might work reforms, if constantly concentrated on a few objects, such as our schools, is diffused in exciting political campaigns over what ought to be done among the many things proposed, how they are to be done, and who are to be the officeholders to carry on the work. [redacted] functions would bring more offices, more politics, more scandals, and add to the confusion of issues, the perplexity of the voter, and the general social strife.

"Investigation" is a word indissolubly associated with office holding. Our Commission has not found any of the managers of the private works we have looked into under investigation. In Richmond, however, the gas works had been under fire by a council committee for months, and the present superintendent's predecessor was in his day investigated; in Detroit there was a newspaper controversy over the qualifications of the Public Lighting Commission's superintendent; in Chicago the Civil Service Commissioners of a

previous administration were found wanting; and in Cleveland the present superintendent of water works had for a year been under investigation, owing, it is said, to the malice of political enemies.

The "secrets of monopoly" may be got rid of simply by the abolition of uncompensated privilege, but bureaucratic administration conceals abuses that defy detection, while its patent abuses are often beyond prevention. Corporations may, on occasions, have obtained unduly favorable franchises from communities, which, through their own neglect, carry the burdens of unfaithful representatives and imperfect methods of civic self-defense—and here is the true crux of reform—but the grafting of the dishonest officeholder has constant opportunity for play, both in taking in and laying out the public's money. 'A sinecure is a graft; a superfluity of offices is graft; an easy "berth" is graft. Salaries and wages above the level paid by employers of good standing are graft. Companies do not make appointments and removals for other than business purposes; every department of the local or general government does so to a greater or lesser extent. This practice, where the aim is social profit, is as absurd as graft. Somewhere and somehow the public purse is ever open to men not delivering a *quid pro quo,* as they would be obliged to do in private business. Where a private gas company builds a railroad siding to carry in its coal a municipal gas works will employ a contractor with wagons. Where a private company could end a transaction without help from a lawyer, an advertisement or a junketing committee, a public enterprise must have them all. The purchases and sales of a company permit few leakages in comparison with those of a municipality.

The new undertakings proposed by the municipalizers would lead to dealings to the extent of many million dollars with tradesmen, builders, architects, etc., to the increase, by hundreds, of important offices, and to the employment of tens of thousands of additional public servants. Party leaders would have their proportion of increased patronage. Every public official is a potential opportunity for some form of self-interest arrayed against the common interest.

No more alluring promise is made by the municipalizers than that, when the first cost of a municipal plant is paid off, a plane of permanent advantage over a private plant is reached, inasmuch as a municipality need not call for profits. The replies to this point are: The few municipalities in Great Britain that can make profits refuse to do so. Many that have tried for profits have failed, the balance showing a loss. The payment for itself by a municipal gas works being but the result of a special tax on the gas consumers, the city's plant represents a sum of money that rightfully should be in the gas consumers' possession. The service maintained by certain classes of municipal plants being of a poorer grade than that required of a company, the special profit of the works is rather apparent than real. The superior service rendered by an unhampered company represents annually a higher profit to the community than is taken in the

company's dividends. The certainty that companies, as a rule, unerringly work to the highest efficiency, actual and potential, has no counterpart in any certainty, as a rule, that municipalities will own their plants free and clear and will then equal company work in costs of operation. Many municipal plants set up in Great Britain in expectation of a speedy extinction of their cost are now deeper in debt than ever. The instability of the policy of a municipality, owing to its changes of officials, and the variableness of legislation, may prevent a plant from paying for itself; or, if it has done so, may expose it at any time to perversion of its functions and to conditions of loss. The absence of political patronage, of the domination at the polls of public servants, of the blunders inseparable from municipal administration, and the natural advantages for prompt and good work of voluntary associations over those of the State operated by a machinery meant only to govern—such factors may permit a company to declare apparently monopolistic dividends where a municipality would operate at a loss, both to itself and to society.

It may be confidently asserted that a country will be better off when served by men provided with even generous franchises than when served in the same functions by municipalities or the State. It is certainly better to have the great industries of the highways operated by private agencies to a high capacity—as they must be, to make returns to investors—than not to have the work done necessary to progress, as is the case with Great Britain to-day in tramways and electricity. The greatest loss to any community is stagnation. The worst condition is inert unproductiveness, with the scientific machinery of production within reach and unused. A poor, insufficient, or uncertain service of gas, water, electricity or street cars is to a community what a want of tools and machinery is to a manufacturer, or the lack of the telephone or telegraph or a quick mail or railway service to the merchant. America has done infinitely better with all these services than Great Britain; she has pursued the most direct course in quickening them into complete and sufficient operation. True, some specially venturesome and able men in America have obtained large fortunes in the process; true is it that had the Fabian policy of Great Britain been pursued in this country with electricity and street cars, these industries would not have produced millionaires—and neither would they have been among the principal agencies in building up our incomparable American cities, with their beautiful and peculiar system of suburbs, or in assisting our producers and commercial classes to a marvelous prosperity, or in furnishing new occupations to half a million wage workers, each of them earning more than double the pay of the average among the few thousands in the same trades in municipalized Great Britain.

A vital effect on the possibilities of success in any enterprise lies in the power of decision and action relative to extensions or retrenchments. A step forward or backward may require a risk, or even a wastage of capital most difficult for a municipality to under-

take. A company learns to face emergencies and accept the consequences. As it cannot tax the public to supply deficits, it studies all the resources of opportunity.

English Municipal Gas Committees deliberately discourage the use of electricity, in order to maintain their gas earnings—an instance of the abuse of both government and monopoly privilege.

The refusal of a municipal administration in America to undertake necessary public works, lest it be charged with extravagance by the opposition, is one of the recognized weaknesses of government by parties. The operation of obsolescent machinery in municipal electric stations was everywhere a feature in the enterprises investigated, here and abroad. The extension of street car lines into new territory, a striking feature of American company practice, takes place in English municipal undertakings only after most dilatory steps on the part of managers or a clamorous campaign on the part of the interested classes among the public.

The question of fares and routes in some British cities is settled on the paternal idea of favoring certain classes, and not on the equitable principle of what pays lives. Once a municipality stands committed to a policy, a method, or a route, or a process, a change awaits pronounced public opinion. No municipality could be expected to have a street railroad pass through the three stages of horse, cable and electric traction within a decade, as happened to a company in New York, or have its machinery for supplying electricity scrapped twice within the same period, as happened in Boston.

To the mind of a manager free to act, the borders of the area of operation, the interior of the power stations, the plant for distribution, even a car or a lamp, forever suggest queries as to profit or loss in making changes. What room is there for progress? Where should enterprise reach out? How can more business be done? And, equally, wherein may the plant be improved? How stop leakages and losses? Where is room for economy? How much scrapping will eventually be profitable?

It is in this domain that private capital can give better service, lower prices and coin dividends, while perplexed and clumsy public service scores losses through indecision and inactivity. Here is an example of free and spontaneous differentiation as contrasted with growth stunted through artificial forms of suppression.

It may be ventured that every community in America affords undoubted examples of the superiority of private over public operation, when the history of the enterprises compared is considered. Struggling communities unable of themselves to defray the costs of their public works, or to command the talent to have them constructed and carried on, have everywhere called in the aid of private capital and unofficial public servants, to the benefit of all parties concerned, especially of the communities themselves. The costs of public services under private ownership and operation have steadily declined, the first factor in falling prices being the establishment of those conditions which are essential to the profitable employment

of capital. The true and successful principle of having a community confide to private agencies powers to supply without conferring on them privileges to exact monopolistic profits, has been followed in innumerable cases throughout the United States.

Unfortunately at a time when we are awakening to the fact that in granting franchises the representatives of some of our cities have acted unwisely or unfaithfully, there have arisen schools of unsound agitators, usually with projects in the background for the support of political parties or ambitious politicians, to exaggerate the evils done, confuse the issues, and promise reform through impracticabilities. Few among these agitators will deny that there have been "muck-rakers" among them, that there is lack of agreement in their forces, that their movement has put unworthy lawgivers in the chairs of city fathers, or claim that they have depended entirely for their instruction in reform on the impartial statements of judicious minds.

The municipalization movement in America has indeed suffered through being tethered to the platforms of demagogues, but its most damaging injuries must finally come through the fact that among its respectable literary supporters have been perfervid sentimentalists roaming unequipped in the domain of practical science and viewing half seen facts in a distorted perspective. These book-builders will now, in the reports of this Commission, have opportunity to reconsider much of their thought and eliminate from their work much that they have written. There may, however, be found a class who will refuse to retract anything, but will go on in their adopted way as if they have met no check through the truths brought to light. If so, they will with certainty in time encounter the disapprobation of the public they would delude.

The intelligent classes of America, recognizing that misleading statements are injurious in proportion to the credit they obtain and to the importance of the matters misrepresented, will hold to account the men who for a time have deceived them. Faithful and accurate information pertaining to the daily life of the people, and their relation to government and the public service, is of the first order of importance, and writers and speakers who persist in uttering falsities in such matters will in the end meet exposure. The masses are prone to pay deference to the standing of authorship and the dignity of the learned professions, and when in the name of such higher social elements, the voters are fed with stories of insensate corporate greed and given advice to abandon American methods of government, the reaction must be justly destructive to the false leaders when their day of reckoning arrives. If the effect makes the crime, issuing false or misleading statements, relative either to alleged offenses of corporations or to the successful achievements of what are shown to be ruinous efforts at reform, is criminal.

What the municipalizers have been believing as to the emphatic success of the Richmond and Wheeling gas works, the Chicago and Cleveland water works and the Allegheny electric works has been a caricature of the truth. On the other hand, that great

social benefits have been conferred on every American city by the private works investigated is incontestable. Each has moved, in the volume of business done and the character of the service, to a stage beyond and above anything possible to a municipal undertaking.

In Great Britain, private ownership in municipal electric and street railway undertakings does not exist as in this country. From the beginning there has been semi-municipalization. The narrow limits within which their owners may exercise the right of private property forbid the natural development of the industries. The short terms of franchises of electric and tramway enterprises leave no just expectations to enterprise. Parliamentary control in one direction, and local government vetoes in another, discourage investment and paralyze development. The recent Socialistic movement in Great Britain has put the discussion of municipalization into a province of rainbow promise and fantastic association, the hopeless poverty of the masses in cases furnishing the votes to give political power to incompetents and revolutionists. The older municipalization movements of the great cities had their birth in endeavors to relieve slum life, with its frightful death rate. Glasgow and London are far behind American cities in facilities for moving the toilers to homes in the suburbs, and for the utilization of electric light and power. Conditions social, political and financial in British cities so far differ from those of American cities that the municipal work of the one country cannot stand, except in a remote and merely suggestive degree, as an example for the other country.

Municipalizers are obstacles in the way of reform where reform is needed. They can rarely, as advocates of a mistaken course and a false principle, state the fact of our municipal difficulties as they are. They too often ignore that theirs is not the only alternative, if an alternative at all, to corruption, excessive charges and poor service where these exist. They fail to see and testify to the inseparable barriers to their methods, and they decry and belittle the aid offered them in practical civic betterments by citizens who refuse to swallow their political nostrums.

CHAPTER X.

MISCELLANEOUS.

Under this heading are grouped certain brief statements of a miscellaneous nature that have no definite place in any of the chapters so far written and yet are a part of the result of this inquiry, and are suggested by a reading of the schedules.

Municipalizers claim that improvement in general municipal governmental conditions will better the chances of success in municipal ownership; but they do not claim generally that improvement in governmental conditions will in the same way reduce the possibility of blackmail and other impropriety in the relations of the city to the public service companies. If the local governments of Great Britain, as the municipalizers claim, are wiser and more honest than

those of the United States, they have conditions that reduce the probability of failure in municipal ownership. We must also believe that under any city government, the effect of private ownership upon the general social good, as well as the care of the street pavements, sewers, the police force—everything in the city with which government has in any way to do—will be improved somewhat in proportion as the character of the government is improved. We must believe that with governments so pure and competent as to be able to manage honestly, and with ability, a public service industry, we would have honesty and ability in the granting of franchises and arranging conditions with public service companies. With honest and able men in office we will have the proper functions of government properly administered. With corrupt or weak men in office, we will have an improper administration of the affairs of governmental functions under whatever system; and the more restricted the functions the less the opportunity for a venal government to exercise its venality and for a weak government to exhibit its weakness. First and above all things an effort for better government, and to this end no unnecessary extension of functions.

We often hear it alleged that threat of the purchase of the plant by a municipality is a spur to good conduct on the part of companies operating public service utilities. If this argument were good, we would expect to find better service and results generally from gas, electric light and tramway operation in Great Britain than from similar operations in the United States. We find, however, that so far from this being the case, the private plants of the United States, having practically no threat of municipal ownership or purchase, are much more of a factor in the social good of a community than are similar plants, municipal or private, in Great Britain where the threat exists. The improvement in service marked in the past twenty-five years has come with experience, and with the employment of highly technical men in these industries, a class not available twenty-five or thirty years ago, because technical training, in the modern sense, was practically unknown at that time and even now rarely found in the employ of municipal undertakings. The reduction in prices has come through the great extension of the business more than from invention, and this extension has been due to the efforts of companies. In vain we search the history of public service industries of the world to find any marked improvement in which the companies have not taken the initiative. This is to be expected, from what was told us by the assistant secretary of the Board of Trade of London of the policy adopted by municipalities in Great Britain—of waiting for companies to blaze the way, and from the absence of progressiveness in municipal operations in this country.

Cheerfulness and contentment of employees have always appeared to the writers as important assets to the owner of a public service plant. If we are right in this opinion, the companies investigated by the Commission have an asset denied the municipalities. Our British experts told us that engineers preferred pri-

vate to public employment. The Committee found evidence of jealousies and dissatisfaction existing in municipal works. One prominent gas works operator complained that the insistence of his committee on the employment of men prevented his attaining such good results as he knew were obtainable—his professional pride was hurt and his professional reputation must suffer.

Any man who has visited the gas works of Atlanta and Philadelphia knows that something—better treatment, opportunity for the attainment of creditable results, pride in the plant, or some other cause—has resulted in a cheerful and contented spirit in the company employees not found in the employees of the municipal gas works of Richmond and Wheeling. This was particularly remarked by Mr. Sullivan, one of the labor representatives of our Commission.

I. ATTITUDE OF PRESS AND PUBLIC.

The information we have gathered as to the attitude of the press and public in Great Britain toward the undertakings examined, and particularly toward the question of municipalization, is in some respects contradictory. The answer to the schedule queries in reference to electric undertakings is comprehensive of other industries as well. Dr. Maltbie, answering these questions, intended to determine the attitude of press and public, says: "Municipalities—Generally favorable, although in every town there is a portion of the press which opposes municipal trading and which watches the undertaking closely." Referring to companies, the answer is "Generally favorable. There is more or less talk about municipalization, but it is not due especially to the delinquencies of the companies."

It appears from these answers that there has been a divided opinion among the press and people as to the wisdom of municipalities conducting trading operations; no unanimous approval where it exists; no great demand for it where it does not exist. (Note: These schedules were written before the recent London and borough elections.)

II. ORGANIZED OPPOSITION TO MUNICIPAL OWNERSHIP.

"London Municipal Notes" is a monthly review of municipal work and progress, edited by The London Municipal Society for the Promotion of Municipal Reform. This society is composed of men of the highest rank and standing in London; it is controlled by men not interested in company work—men who have means and leisure to enable them to devote their time and energies to what they believe to be the public good. It was not formed to oppose municipal trading, but to advance municipal interests generally. It is generally credited by the Progressive party of London with being responsible for the overthrow of the Progressive party and its vagaries in the recent borough and county elections in London, by analyzing the results of municipal operation in London and disclosing the truth. It is opposed to all municipal trading.

On the list of officers are the names of H. Percy Harris, Esq., of the London County Council; Captain G. S. C. Swinton, L. C. C.;

the Duke of Norfolk; Joseph Chamberlain, M. P.; the Earl of Hardwicke; Earl Fitzwilliams; Lord Hamilton, M. P.; Lord Avebury; Lord Cheylesmore, mayor of Westminster; Austen Chamberlain, M. P.; Walter H. Long, M. P.; Sir Joseph Dimsdale, M. P.; W. Hayes Fisher, M. P.; Captain H. M. Jessel, M. P.; Major Leonard Darwin; W. G. Towler, Esq. No list of names carrying an evidence of greater zeal in the public welfare, greater services to the public, or higher type of British citizenship could be made up of residents of the British Isles.

Professor Goodnow, in his admirable essay on British municipalities, referring to the associations of ratepayers in Glasgow, says: "The policy of these associations, as stated by their secretaries, has not been to oppose the municipalization of trams, gas, electric and water supply. Indeed, they have no criticisms to make on the administration of these enterprises in Glasgow, when confined to their proper spheres. At the time the Citizens' Union was organized, in 1898, the socialistic programme was in full swing, and there were propositions seriously considered by the council of extending municipal ownership further—to housing, banking, insurance, cemeteries, tailoring, baking, etc. It was these extensions that the union was organized to combat."

These two organizations, the Ratepayers' Federation and the Citizens' Union, "are composed of the same individuals, with their offices in common, but separate secretaries. Their only difference is that the one—the Citizens' Union—is organized to combat municipalization through politics and agitation, while the Ratepayers' Federation is organized to oppose the policy in Parliament and in the courts."

As far as we know the facts, Professor Goodnow's statement is correct. The inference drawn from his statement by persons not familiar with other facts might be misleading. As Mr. Arthur Kay, probably the most prominent member of these associations, said in effect: "The associations are not opposing the municipalization of gas, electric light and tramways which were *faits accomplis* at the time of the formation of the associations, but their experience with the city's administration of these industries has led them to oppose any and all extensions of municipal trading."

We quote from Mr. Kay's testimony before the Joint Select Parliamentary Committee on Municipal Trading (page 53 of the report), as follows:

> "Question by Mr. Fenwick:
>
> "Do you represent any society in Glasgow, or do you come here simply to express your own opinions?"
>
> "Well, I am here to a certain extent, I may say, under the minute of the Ratepayers' Federation. I am authorized by the directors of the Ratepayers' Federation."
>
> "You speak, therefore, in their name as well as in your own?" "Yes."
>
> "Then I may take it that if it can be shown that the finance is sound you are not opposed to municipal trading

on principle?" "I am certainly opposed to municipal trading on principle; but you asked me what was the national danger, and I say, in my opinion, the greatest national danger is the finance."

III. ENTERPRISE.

The readiness with which companies discard apparatus, either become obsolete with time or found to have been mistakenly installed, can be well compared with the unwillingness and slowness of municipalities in discarding obsolete or ill-advised apparatus. As Mr. Madgen said to the Committee: "Progression demands wastage of capital." The assistant secretary of the Board of Trade, Mr. Pelham, told the Committee that they did not encourage the trying of new inventions or the trying of systems in any way experimental, by municipalities. They waited for these to be proven out by private companies. Progress is all with the companies.

The discovery of natural gas in the vicinity of Wheeling, and the municipality's attitude toward it, form an excellent instance of the backwardness of a municipal department in adopting improvements. Private companies, with few exceptions, recognizing the new agent and its importance—adopted the new gas, and did what they could to help the city and citizens to secure a full supply at the earliest moment. The one municipality that sought to deprive its citizens of the full and free use of this highly valuable product of nature was a municipality owning a decrepit and inadequate gas plant. With the affection of a parent for a crippled offspring, the Wheeling city government attempts, so far with success, to protect its cripple from competition with the new and lusty applicant for public favor.

IV. EDUCATIONAL PREPARATION OF EMPLOYEES.

The part taken by the employees of municipal gas and electric departments at meetings of technical associations, or as contributors to technical journals, compared with the part taken by employees of companies, is somewhat indicative of the professional attainment and standing of such employees. Taking the *Electrical World and Engineer* as the standard electrical paper in this country, and the "American Institute of Electrical Engineers" as the standard electrical association, we have had an investigation made of the files of the journal and the proceedings of the association for a period of five years (1901 to 1905, inclusive), and find but two contributions by employees of municipal electric plants. These are both by one man—Mr. A. E. Winchester, of South Norwalk, Conn. Neither paper is technical in its nature. The American Institute of Electrical Engineers has only one member who is an employee of a municipal plant.

Similarly, selecting the *Progressive Age* and the *American Gas Light Journal* as the standard gas journals, and the "American Gas Light Association" as the standard association, it appears that in the same period not a single paper or contribution was made

by an employee of a municipal gas plant. The American Gas Light Association numbers five such employees among its members.

The question of technical equipment as between the employees of municipalities and the companies is not open to argument. We know that at Richmond the municipal plant has no technically educated gas engineers, while at Atlanta there are in the company, besides President Cosgrove, three trained engineers, two of whom, with President Cosgrove, are graduates of technical institutions of high standing. We know that in the list of American municipal undertakings of all sorts the corps of engineers is but a corporal's guard as compared with the large number employed by the private companies. We are not, therefore, surprised to find that all engineering matters in connection with these plants, including construction of plant, generation, distribution and utilization of product, are much better conceived and executed in the plants controlled by private companies than in the plants controlled by municipalities. As between the companies and the municipalities, the former has the larger fund of knowledge and experience to draw from. From the body of men attached to the companies we expect the larger initiative, the more certainty in experiment, the better judgment as to construction and operation. In a word, the brain power at the disposal of the companies for the benefit of the communities is many times greater than that at the disposal of the municipalities.

The man best known among all in charge of the municipal plants that we have examined in this country is occupying an engineering position with the education and training of a teacher of political economy.

A comparison of the organization employed by the city of Philadelphia in the operation of its gas plant with that employed by the company now operating the plant is pertinent to this inquiry, and will indicate, without criticism of the ability or good intent of any one, the relative appreciation of the importance and possibilities of gas manufacture and supply, by those who were responsible for the operation of the plant under municipal management and by those who are now responsible.

The framework of the organization under municipal management was as follows:

There was a "Chief Engineer of the Gas Works." To him reported an assistant, a general bookkeeper and controller, a superintendent of distribution, a superintendent of stables, a registrar and chief meter inspector, a chief clerk and paymaster, superintendents of the three works, an architect and draughtsman, a superintendent of shops and superintendents of four offices.

Whatever this force may have learned through experience in operating the Philadelphia gas works, there was not one man in the list who was technically educated, and but one who had any previous gas-works training for the work which he was called upon to perform—not one trained or properly prepared to solve the engineering problems inseparable from the operation of a large

modern gas plant—not one scientific man in the force conducting the highly technical, chemical and physical processes of this great industry.

The engineering force of the company now operating the works reports to a vice-president, who has been engaged in the gas business for thirty-three years and who carries a mechanical engineer's degree. The commercial force reports to another vice-president of long experience and wide reputation. The operation and maintenance of the works department is under the direction of the engineer of works, a graduate of the Polytechnic College of Pennsylvania in mechanical engineering and of the United States Naval Academy, as an officer in the Engineering Corps, and who has had twenty-three years' experience in constructing and operating gas works. The engineer of distribution, having in charge all the operations connected with the supply of gas from the time it leaves the gas holder until it passes the consumer's meter, is a graduate of the University of Pennsylvania in the mechanical engineering department, and has had over twenty years' experience in the manufacture and distribution of gas, according to the methods of The United Gas Improvement Company.

Among the assistants to the engineer of works and the engineer of distribution, and devoting all their time to the work of supplying the city with gas, are forty-one men carrying technical degrees gained at Pennsylvania, Stevens, Princeton, Cornell, Johns Hopkins, University of Virginia, Case College, Naval Academy, Sheffield Scientific School of Yale, and other educational institutions. These men occupy positions of responsibility of all degrees, and are, many of them, of long experience, while others have only recently been added to the force. In this force are engineers, chemists, physicists, economists, designers and constructors, as well as men of the broadest general scientific attainments.

There are also employed in the force reporting to the engineer of works and the engineer of distribution thirty-four graduates and students of manual training schools, some of whom have come to positions of large responsibility.

The system of the operating company comprehends a cadet corps, which is recruited annually from the best technical schools in the country. These men, as they grow in experience and ability, are promoted, or accept employment in other gas companies, their places being filled by other more recent graduates.

Those who favor municipal ownership and operation claim that, under this system, by using the profit to pay for the plant, they soon have the plant free from debt and relieved from any obligation to show a profit. There is a fallacy in this assumption, but granting it correct it is not for the good of the industry to take from it the greatest incentive of improvement and progress. Freedom from obligation to make money in a trading venture, which means freedom from the necessity of extending service and conserving energy, is not good for any industry, and its results cannot be beneficial to any community.

V. APOLOGIES FOR THE RESULTS OF MUNICIPAL OWNERSHIP.

In the course of our investigation we have often heard expressions such as "municipal ownership had no chance"; "municipal ownership was handicapped from the start by choice of a bad site, or by paying too much for the land on which the plant was built, or otherwise"; "municipal ownership would have been a success, in such and such a place, but for bad political conditions"; "municipal ownership would have been a success, in such and such a place, but for bad management, the superintendent being obviously unfit for his duty"; or "municipal ownership would have been a success but for the corruption attending it." We hear such expressions as these from advocates of municipal ownership, who seem to lose sight of the fact that all of these mischances are a part of the problem, and that where we find bad management, bad political conditions, high prices paid for land or machinery, or poor engineering, with municipal ownership, municipal ownership is to be charged with them, and they are a reason against municipal ownership.

The efforts of the National Civic Federation have resulted in a Commission of Americans, whose first interest is to do what they may to preserve and continue the good in the American idea and American institutions, believing that the high state of civilization and of prosperity in America justify the American idea and the American method, and place the burden of proof heavily upon those who would say another idea and another method would result in improvement in the condition of the people.

Believing this to be the thought and intent of the membership of the Commission and of the Committee subordinate to it, we still believe that there are ills in the American body politic that may be remedied or cured. We believe that the remedy should be applied and the cure effected without any unnecessary departure from the American idea and the American system. We believe that the framework upon which may be built purity of administration and the highest possible good of the citizens is in existence with us, and that it is not necessary, in the effort to cure the ills from which the body politic may be suffering, to destroy that body. We submit that, living in a land where peace and prosperity are the common lot, we must be very cautious of change. This does not mean that where abuses are found to exist they should not be promptly and mercilessly eradicated, but it does mean that changes in system should be undertaken only after conclusive proof that such changes will result in bettering the condition of the individual. We had better bear the relatively few ills we have than subject ourselves to unknown conditions that may bring greater ills in their train.

CHAPTER XI.

CONCLUSION.

We who have written these chapters hope that each of our readers will examine the data contained in the second volume of

the Commission's proceedings, that he may learn for himself how far we have succeeded in our purpose to accurately interpret the contained statements, and that he may obtain a greater familiarity with the work of the Commission.

Our investigation has determined with certainty many heretofore mooted questions. It indicates the probably correct answers to other mooted questions. Where the facts are clear and the conclusion evident our task has been to summarize and indicate. Where there is remaining uncertainty as to facts, and conclusions are not evident, we have made an effort to determine the probabilities. This has resulted in arguments based on such facts as our investigators have recorded, and on our own experience as operators and observers. We have endeavored, in writing these chapters, as far as possible to avoid technical discussion. Our aim has been to make them readily understood by men unfamiliar with the industries of which we have written. It has been necessary in a few instances, and notably in connection with the discussion of the candle power of British gas to depart from this rule, and we regret that the non-technical reader may not be able to follow easily each step of this part of our argument.

We believe no intelligent reader of the voluminous record of this Commission's work will fail to conclude that it clearly proves municipal ownership to be productive of many and serious ills, with little or no compensating good.

The writers of these chapters, agreeing we believe with the other members of the Committee of Twenty-one, that public service companies should reasonably be regulated and afforded the protection that comes with regulation, and appreciating that the Committee was not appointed or constituted to consider methods of regulation, nevertheless desire to record their opinion, that some form of regulation of private companies should be adopted in each of the United States. What that form should be this Commission is not, by any investigation or any study it has made, prepared to suggest.

Finally, we who stand in opposition to municipal ownership, speaking, we believe, for all individualists, arraign the arrogance of many municipalizers in assuming that they exclusively occupy the field of reform in dealing with the problems concerned, and that they are the sole promoters of measures of economic improvement in municipal affairs. We assert that the opponents of municipal ownership and operation, firm and consistent supporters of justice, are the class seeking the public welfare intelligently and in accordance with American principles. On this point we do not yield to any body of men. We seek, as a first principle, to insure to every man his own. In doing so, and in endeavoring to protect the public against oppression and error, we find it our duty to demonstrate the errors in the schemes of municipalizers and Socialists and to warn against the oppression that they threaten. We are resisting efforts to put burdens on the backs of the American people. We cannot remain silent while the attempt is made

to thrust costly and impracticable projects upon customers of public service corporations and upon the public at large. We know the truth will out. We are confident that ultimately the American people must appreciate at their value the unsoundness of the arguments of the municipal socialists. We shall aid in hastening the day when our fellow citizens will know through discussion what the public of London have been taught by bitter experience. London has awakened to the perils of municipalization, as is evidenced by its verdict in the recent borough and county elections. In that great city the municipalizers have led their fellow citizens astray, and their dupes, finding it out, have administered to their false guides an overwhelming rebuke.

We individualists are not seeking to lead the people in strange paths; our aim is to keep them in the paths they have heretofore trod; paths well known, along which the American people have marched to heights of prosperity and civic development not known heretofore to the civilized world. Along these paths have been stumbling blocks. Our opponents are endeavoring to persuade us the sole responsibility for these stumbling blocks rests upon our public service system, to be remedied only by a change of system. This we deny. We are patiently studying the ways of justice. Municipalizers advocate experimenting, at enormous cost, with public funds, with the principles of liberty and with the institutions of our country. In this we stoutly refuse to take part. We are conservatives in believing that it is better to adhere to old and tried methods based on our accepted national principles; but radicals in the determination to discover, sternly to rebuke and to rectify any injustice which may have been developed by the present system. We maintain that, in this policy, which is not the policy of *laissez faire,* we are guided by the ripest wisdom of the present time, and of all time, and that we are conserving the causes of American development. Our country has been developed upon the theory that the individual is the unit and that to permit to the individual the greatest possible freedom, providing coincidently against his abuse of this freedom, is to insure to the nation the greatest possible good. When the task was the conquest of prairie and forest, its accomplishment was within the power of individual effort. How well it was accomplished the wondering world knows. The result is not alone nor best seen in millions of comfortable homes, hundreds of millions annual value of exportable products of plow, pick, loom and furnace; the highest product of this individual and family effort, this successful struggle of man and woman with the forces of nature, is what is known, admired and feared as the American character; and of the American character the very essence is individualism—initiative and aggressive. Following the conquest of prairie and forest came the necessity of moving vast quantities of grain and cattle to ports of consumption and export. Coincidently came the invention of the steam railroad. The power of initiative and the spirit of adventure developed in the struggle of our predecessors against the wilderness,

led them and their successors to undertake transportation tasks soon found to be beyond the power of single man. As they, in the first years of struggle for a home, had joined with their neighbors for the house raising or other occasional task beyond the physical resources of the individual, their successors joined in incorporated companies for the accomplishment of ends beyond the financial resources of the individual. Coincidently with a railroad development, unparalleled in countries where individualism has been less pronounced, came the wonderful growth of America's cities. With this growth has come the necessity of certain public service work—water supply, lighting and transportation; work done for a price and, to the American mind, a proper field for individual effort. Again comes the company, a voluntary association of individuals, to accomplish what is beyond the power of one, as in the old house-raising days. As it has always been the function and duty of government to insure that individuals shall deal justly with their fellows, it is now the function and duty of government to protect the governed against injustice on the part of these associations of individuals working under the name of public service companies. Any government that is too feeble or corrupt to control with justice the conduct of a public service company, has little prospect of being able itself to supply such public service with efficiency and justice. Our duty is to elect to office men who have the intelligence and integrity to govern efficiently, honestly and justly; men who can and will curb the unjust aggressiveness of the individual, or of the voluntary association of individuals, and who can and will compel each to bear its share of the burdens of government, and give in price, service or otherwise a proper consideration for special privileges enjoyed. Our nation is what she is industrially and commercially and in world politics because of the American character, developed by the most absolute individualism, and because of the American company, developed under a government that governed but did not trade. Our duty is to conserve the human agencies that have made our country what it is—the adventurous individual and voluntary association—but not to let them be our masters. This is the confession of faith of the anti-municipalizer—the anti-socialist.

BRITISH TRAMWAYS

(Street Railways)

By W J. CLARK

It should be stated for the benefit of general readers that no American street railways were investigated by the Commission, and that the only tramway installations which were directly investigated in the United Kingdom are the following:

Municipally Owned.	*Privately Owned.*
Manchester,	London United Tramways,
Liverpool,	Dublin United Tramways,
Glasgow,	Norwich Electric Tramways.
London County Council.	

Schedules relative to these properties, prepared by the experts of the Commission, will appear in Volume II. of this report.

Extracts from these schedules and comments or opinions based solely thereon, would convey little knowledge as to the corporative advantages of municipal and private ownership and operation of local transportation systems, excepting in so far as the particular properties covered thereby are concerned.

Believing that the public desires a clearer understanding of local transportation conditions in the United States and the United Kingdom than would thus be given, and that it further desires an opportunity of making intelligent comparisons between these conditions in the two countries, an attempt will be made herein to meet these requirements before specifically dealing with the tramway plants investigated in the Kingdom.

It is obvious that the great value of local transportation systems exists in their extent and the consequent facilities afforded thereby for public travel, together with all of the attendant advantages, such for example as those which improve the moral and sanitary conditions of communities.

It is well known that the entire development of street railways in the United States has been accomplished by private enterprise, which fact has permitted the construction of extensive systems, serving entire communities, and linking them together irrespective of any particular municipal boundary lines.

In the United Kingdom, since 1894 at least, actual municipalization of such systems, or the desire so to do on the part of public officials, has controlled such development there, and the creation of systems has to a great extent been confined within the narrow limits of the respective municipalities controlling the same.

The effect of the two policies on development and the facilities which they have afforded the public should therefore be carefully considered.

According to the British Census of 1901, 69 per cent. of the entire population of the United Kingdom was urban in its character. This computation included as urban population the residents in England and Wales in towns of 2,000 population or over and the residents in Ireland and Scotland in towns of 3,000 population and over.

The total of such urban population was 29,144,726.

According to the United States Census of 1900, its urban population was 44.6 per cent. of the total inhabitants. This computation included, however, residents in communities of 1,000 population or over.

The total of such urban population was 33,850,000.

In the comparisons which follow there is a slight advantage in showings in favor of the United Kingdom because the population in communities of less than 2,000 is not included to make up the total urban population as is the case in the figures given for the United States.

The British Parliamentary Return on Tramways for 1902, and the United States Census Bulletin on Street Railways for the same year (the last official publication covering details of all American street railways), contain figures quoted below, and, with the above totals on urban population of the respective countries, are the basis for the calculations accompanying such figures.

In 1902 the total length of tramway track in the United Kingdom was 2,336 miles.

In the United States there were 22,328 miles of track.

The urban population in the Kingdom was therefore 12,476 per mile of track.

In the United States, 1,516.

Therefore, the urban resident in the United States had comparatively eight and one-half greater trackage facilities available to him for travel than had a similar resident of the United Kingdom.

The same year there were 7,752 cars on British tramway lines, or one for each 3,760 of the urban population. In the United States there were 59,000 cars, or one for each 574 of the urban population.

It is thus apparent that the urban resident of the United States had comparatively more than six and one-half times the number of cars available for his use than were available to the English urban resident.

A total of 1,394,452,983 passengers were carried in 1902 on the tramways of the United Kingdom.

On the street railways of the United States 5,521,509,521 passengers were carried. Of this last, however, 1,062,403,392 were on transfers, or practically 90 per cent. of the entire number of passengers carried in the United Kingdom. Thus American street railways carried free nearly as many passengers as the entire number carried in the United Kingdom, all of whom that are accounted for paid fares.

We hear a great deal of talk about the overcrowding of cars in American cities. The above figures clearly demonstrate, however, that, on the basis of passengers carried per car per year, the American street railway car averages but slightly more than one-half the passengers carried by the street railway car of the United Kingdom. That is, the American car averages 93,585 passengers per year as against 182,463 passengers per year carried by the average car of the United Kingdom.

The average number of rides per capita of the urban population in the United Kingdom was 48 as against 161 in the United States, which fact speaks volumes for the appreciation of extended facilities by the public of the United States.

The average receipts per passenger in the United Kingdom was 2.26 cents as against 3.76 cents in the United States. However, 9.65 passengers rode per car mile in the United Kingdom as against 5.2 passengers per car mile in the United States. These figures show 21.81 cents revenue per car mile in the United Kingdom as against 19.55 cents revenue per car mile in the United States.

In other words the British passenger paid about 60 per cent. of the rate of fare paid by the American passenger, but as above stated, his facilities for travel were from 12 per cent. to 15 per cent. of those enjoyed by the American passenger.

In 1902 there were two cities of over 100,000 population in the United Kingdom without street railways.

In the United States there were none.

In the United Kingdom there were seven cities of from 50,000 to 100,000 population without street railways.

In the United States there were none.

In the United Kingdom there were 39 cities of from 25,000 to 50,000 population without street railways.

In the United States there were none.

In the United Kingdom there were 295 communities of from 8,000 to 25,000 population without street railways.

In the United States there were 21.

In 1890 the length of tramway line (not track) in the United Kingdom was 948 miles. In 1902 it was 1,484 miles, showing an increase in twelve years of but 536 miles.

In 1890 the length of street railway line in the United States was 5,783 miles. In 1902 it was 16,538 miles, showing an increase in the intervening period of 10,755 miles, or an increase nearly twenty times as great as that in the United Kingdom.

The increase in passengers carried between 1890 and 1902 in the United Kingdom was 868,083,655.

In the United States the corresponding increase was 3,598,499,-319, or say four and one-half times greater than that in the United Kingdom, which of course is not a growth proportionate to the great increase in facilities afforded in the United States.

To put it in another way, the passengers carried per mile of line in 1890 in the United Kingdom were 555,232; in 1902, 939,658, showing an increase in the intervening period of 394,426.

In 1890 in the United States 349,838 passengers were carried per mile of line. In 1902 but 333,862, a decrease of 5,976.

These features clearly demonstrate that the British policy has been to electrify and not greatly extend existing tramways, except through densely populated districts, which means obtaining the greatest possible revenue without affording adequate transportation facilities, whereas in the United States, private enterprise has constructed lines which afford public facilities, but which in many instances do not bring an adequate return.

It is well to note in this connection that the policy pursued in the United Kingdom must necessarily result in low rates of fares. If, in such cities as New York, Philadelphia, Chicago and St. Louis, we were to cut down the miles of track to correspond to the conditions prevailing in such cities as London, Glasgow, Manchester and Liverpool we would find that there would be only about 21 per cent. of the present track, and furthermore, that this comparatively small and inadequate trackage would be, for the most part, confined to the densely populated districts. If a person desired to travel beyond this section, it would be necessary for him to walk or use some conveyance other than the electric car.

If American street railway systems were cut down as indicated, the fares could be very materially reduced, for two fundamental reasons. First, the permissible length of ride of any one passenger would be very materially reduced, and second, the company would be operating its most profitable lines only, while those which are at present run with little profit and in some cases even at a loss, would not be embarrassing and handicapping the company as they are to-day.

From 1902 to 1905 the miles of tramway track in the United Kingdom had increased from 2,336 to 3,376, a total of 1,040 miles.

In the United States, during the same period, the increase in miles of street and similar railways was from 22,328 to 33,250, a total increase of 10,922, or over ten times the increase in the United Kingdom.

During the same period the increase in cars in use on British tramways was from 7,752 to 10,344, a total increase of 2,592.

In the United States the increase was from 59,000 cars in 1902 to 79,751 in 1905, a total increase of 20,751, or between seven and eight times as great as in the United Kingdom.

Some comparison of facilities available in cities of comparatively the same size in the two countries may be desirable. Hence the following:

COMPARISON OF MILES OF STREET RAILWAY TRACK IN CERTAIN CITIES.

UNITED KINGDOM—1905.

(Figures on track from Parliamentary Return On Population from tables of London Electrician.)

UNITED STATES—1902.

(All figures from U. S. Census Reports.)

For the United States the figures given cover only the actual trackage within the incorporated limits of the respective municipalities, *and do not* include the extensive suburban and interurban track connected therewith.

Needless to remark that from 1902 to 1905 there was a considerable increase of trackage in the American cities.

If we consider the twenty largest cities in the two countries, we find the following most interesting facts:

The combined population of the twenty American cities is 12,854,897 as against 14,771,518 for those of the United Kingdom.

The combined miles of track for the twenty American cities is 5,966 as against 1,567 for those of the United Kingdom.

The average population per mile of track for the twenty American cities is 2,155 as against 9,426 for those of the United Kingdom.

United Kingdom.

STREET RAILWAYS—1905.

Cities.	*Population served.*	*Miles of track.*	*Population per mile of track.*
Greater London	6,581,000	274.68	23,958
Glasgow	1,000,000	147.62	6,779
Manchester	850,000	146.19	5,130
Liverpool	798,000	104.	7,663
Birmingham	650,000	44.5	14,606
Leeds	450,142	89.07	6,765
Sheffield	432,940	65.83	6,577
Potteries District	400,000	38.43	10,409
Dublin and District	393,994	107.5	3,685
Belfast	358,680	73.14	4,767
Bristol	358,000	52.	6,885
Edinburgh	331,997	43.	7,720
Bradford	324,000	96.69	3,351
West Ham	300,000	17.03	17,616
Salford	300,000	70.75	4,242
Newcastle-on-Tyne	300,000	49.85	6,017
Hull	253,865	27.19	9,368
Nottingham	239,800	30.12	7,961
Leicester	228,100	37.00	6,165
Bolton	221,000	42.2	5,237

United States.

STREET RAILWAYS—1902.

Cities.	*Population served.*	*Miles of track.*	*Population per mile of track.*
New York	3,716,169	1,349	2,754
Chicago	1,873,820	925	2,026
Philadelphia	1,367,716	540	2,533
St. Louis	612,279	345	1,775
Boston	594,618	253	2,073
Baltimore	531,313	228	2,330
Cleveland	414,950	182	2,280
Buffalo	381,403	198	1,926
San Francisco	355,919	283	1,257
Pittsburg	345,045	176	1,960
Cincinnati	332,934	197	1,690
Milwaukee	313,025	117	2,675
Detroit	309,619	316*	979
New Orleans	300,625	176	1,708
Washington	293,217	150	1,955
Newark (N. J.)	265,394	94	2,632
Jersey City	219,462	60	3,658
Louisville	215,722	125	1,726
Minneapolis	214,112	128	1,673
Indianapolis	197,555	124	1,593
Providence	186,742	80	2,334
Kansas City	173,064	133	1,301
St. Paul	172,038	105	1,638

The above thoroughly demonstrates that the primary object for which local transportation lines are created, to wit, giving best of public facilities, has been far better attained in the United States than in the United Kingdom.

Another point of great advantage in American street railways as against those operated in the United Kingdom is that the former are, on the average, operated 18 hours per day, while those of the latter do not average more than 15 hours operation each day. Then, too, in the larger American cities there is an all night service, while such is not the case in the cities of the United Kingdom.

It is sometimes alleged that one reason for the backwardness of tramway development in the United Kingdom is that it commenced at a much later period than in the United States, but there is little weight to this argument for the first horse car was operated in America on the old Madison Avenue Line, New York City, in 1854, while the first in England was at Birkenhead in 1861.

It is true that the development of electric traction enterprises by British municipalities did not commence until a much later date than in the United States; in fact no moves were made

* There is probably some error in this census figure.

in this direction until its great success had been thoroughly demonstrated in America, on the Continent, and even in the Kingdom itself by private enterprise at Leeds, Dublin, and elsewhere, and long after private enterprise had expended enormous sums in perfecting its operation, thus obviating the necessity of British municipalities standing any portion of the tremendous development charges of what has been so beneficial to humanity, and which has added so materially to the capital charges of traction companies the world over.

This is thoroughly illustrated by the following extract from the report of the Glasgow Commission on Tramways after its visit to America, during the latter part of 1896:

"American managers and engineers, while they smile at our still continuing to operate with horses, at the same time congratulate us on our having been able to wait. The pioneers of the electric overhead system have come through a trying and expensive experience. The first motors, generators and equipments were crude and soon had to be thrown aside in favor of newer designs. They also in their turn become obsolete. Even up till within the last two years great improvements were made, but now it is generally believed that engines and generators, motors and line equipments have all been by experience so much improved that now they are practically standardized, and they can undoubtedly be bought at very much less money than at any former time."

Consequently, with all this past experience of others before them, the progress of British municipal officials in tramway development in recent years should have been very rapid, but, as stated, it has not been so.

The taking over of British tramways from their company owners by the municipalities, while in accordance with the Tramway Act of 1870, under its so-called "Scrap Iron" clause, can hardly be designated other than as legalized confiscation. How little these municipalities paid for the properties which they thus acquired and the losses and pioneer work which went therewith, few realize.

According to the Parliamentary Return of April 5, 1906, on Tramways and Light Railways, it appears that in England and Wales there were expended by local authorities on construction or purchase of old lines and works now superseded, but £2,516,148

In Scotland for the same purpose.....	130,837
In Ireland	332,364
Total for the kingdom.....	£2,979,349

or say $14,800,000 covering the most valuable tramway properties in the kingdom, a less figure than has been paid by present street railway companies in several medium size American cities for the plant and business of the companies which have preceded them.

The strongest arguments ordinarily advanced by the advocates of municipal tramway ownership, are the profits which the municipality or public receives from their operation, and there is a mistaken impression prevailing that these are comparatively larger

than similar financial benefits which American municipalities derive from street railway companies.

The British Parliamentary Return for 1906 on Tramways and Light Railways shows that the total rates and taxes paid by the tramways in the kingdom were £121,761 for the companies and £262,527 for the municipalities, a total of £384,288, or say $1,900,000.

Differently than is ordinarily supposed, about one-half of this amount goes to the National Government, which levies an income tax of 5 per cent. upon the net earnings of the tramways, so that the municipalities receive direct from those sources less than a total of $1,000,000.

For the sake of comparison it should be said that the street, surface, elevated and underground railways of New York State in the year ending June 30, 1904, paid in taxes $3,943,697, and that in 1902 the operating and lessor street railway companies in the United States paid in taxes $13,366,335.

It is estimated that the total taxes now paid by the street railways of the United States are about $18,000,000.

It will be rightly argued by the advocates of municipal ownership that the municipalities which own tramways derive financial benefits therefrom other than the mere receipt of taxes through the re-payment of the debt incurred for the creation thereof, by sinking fund or otherwise; the sum set aside for depreciation and renewal funds, and actual net profits which are or should be applied to the relief of taxation.

To best illustrate what the British municipalities and local governments are receiving from tramway operation, and to compare the same with conditions in the United States, the following tabulation is given:

United Kingdom.

Estimated total derived from Municipal and Company Tramways by Local and Municipal Government from taxation	£200,000
Repayment of debt or sinking fund by Municipal tramways	663,336
Reserve, including depreciation and renewal funds	623,617
Relief of Rates (Local Taxation)	205,981
Other matters, including balance carried forward from fiscal year ending March 31, 1906	96,587
Total possible financial benefits derived by National and Local Governments from operation of tramways in the United Kingdom	£1,789,521
Or say	$8,679,176

Subsequently the inaccuracy of the British Municipal Tramway accounts will be shown and their tendency to unfairly demonstrate favorable results from operation in such a manner as to thoroughly discredit them and show that the above is far more favor-

able than actual results secured; but for the purpose of comparison it is necessary to here take the official statements as made in the Parliamentary Report on Tramways and Light Railways, 1906.

United States.

1906.

Estimated taxes paid by operating street railway companies based on 33 1/3 per cent. increase in actual amount of $13,078,899 paid in 1902	$18,310,458
Estimated taxes paid by lesser street railway companies same as actual in 1902	287,436
Estimated personal taxes paid by holders of capital stock, $1,844,565,136 (see U. S. Government Statistical Abstract, 1906), at one-half of one per cent.	9,222,820
Estimated personal taxes paid by holders of bonds, $1,524,371,926 (see U. S. Government Statistical Abstract, 1906), at 1 per cent	15,243,719
Total	$43,054,433

So it is seen at a glance that the state and municipal governments of the United States receive at least $34,375,257 per annum more from the operation of street railways than do the local and municipal governments of the United Kingdom.

Now to correct some of the inaccuracies of British municipal accounting.

According to the Parliamentary Report on Tramways for 1906, the total paid up capital of municipally owned tramways of the kingdom was £35,423,947, on which as already credited to public earnings from tramway operations in the foregoing calculation but £800,751 had been allowed for depreciation or slightly less than 1.83 per cent.

Every practical man realizes that at least 5 per cent. should be allowed for depreciation, so a proper charge for this on the paid up capital of £35,423,947 would be £1,771,197. Consequently the difference between the actual sum provided for depreciation, viz., £623,617, and the proper figure just stated, amounting to £1,147,580 or $5,565,963 should be deducted from the $8,679,176 shown as the returns to the local and municipal governments of the United Kingdom from the tramways, leaving net only $3,113,213.

This shows that the net return to local public authorities in the United Kingdom is $925 per mile of track, whereas in the United States it averages $1,295.

The difference in favor of the United States on this phase of conditions would naturally be improved if proper additions, amounting to many millions, were made to the capital account of British municipal tramways. While if the great increase in taxable values and returns therefrom arising from the more general development of street railways in America were taken into account, the financial returns to American state and municipal governments would be

demonstrated as enormous; all of which has resulted without the taxpayers being subjected to any risk whatever.

Advocates of street railway municipalization have little to say on the feature of risk to municipalities and their taxpayers due to embarking in such enterprises, but that serious risks do exist from so doing is illustrated by the following list of British municipal tramway undertakings, which, according to the Parliamentary Return for 1906, show direct loss from operation or an actual deficit when sinking fund payments and reserves for depreciation are considered.

Ashton-under-Lyne.
Barking Urban District Council.
Bexley Urban District Council.
Blackburn.
Cardiff.
Chesterfield.
Colchester.
Darlington.
Doncaster.
Dover.
Erith.
Failsworth, Farnworth and Kearsley Urban District Council.
Gloucester.
Heywood.
Ilkeston.
Ipswich.
Keighley.
Lancaster.
Leyton.
Lincoln.
London County Council—Northern System.
Maidstone.
Matlock.
Nelson.
Plymouth.
Pontypridd.
Rachdale.
Southend-on-Sea.
Southport.
South Shields.
Stalybridge, Hyde, Mossley and Dukinfield.
Swindon.
Walthamstow.
Warringdon.
Wigan.
Kilmarnock.
Kirkcaldy.
Leith.
Perth.
Belfast.

It is thus seen that out of a total of 175 municipally owned tramways and light railways, 40 on the face of their own reports show deficits, and this number would be greatly added to if the accounts of the various municipal undertakings in the United Kingdom were properly kept.

Much credit is taken by the municipalists for the improvement of labor conditions arising from many British tramways coming under municipalistic control.

This subject has been so thoroughly treated in the admirable paper by Professor John R. Commons and Mr. J. W. Sullivan, which will be published as part of the records of this Commission, it is considered unnecessary to dwell on this feature to any great extent other than to say that rates and hours of labor on American street railways have improved comparatively as much from the days of animal traction up to the present as has been the case in Great Britain.

It is also considered well to insert the following comparative table showing rates of wages paid conductors and motormen on certain British tramways and on certain street railways in the State of New York. The figures are from the paper of Messrs. Commons and Sullivan and the New York Railroad Commissioners' Reports.

System.	*Conductors, rates per hour.*	*Motormen, rates per hour.*
Glasgow	11.2 cts. to 13.9 cts.	11.2 cts. to 13.9 cts.
Manchester	11 cts. to 13.5 cts.	11.5 cts. to 14 cts.
Liverpool	10 cts. to 12 cts.	12 cts. to 13 cts.
London County Council.	11.6 cts. to 15 cts.	11.4 cts. to 15 cts.
London United	9.6 cts. to 12 cts.	12 cts. to 14.4 cts.
Dublin	7.2 cts. to 9.84 cts.	8.4 cts. to 11.14 cts.
Norwich	7.5 cts. to 9 cts.	9 cts. to 10 cts.
New York City Ry.	20 cts. to 25 cts.	22.5 cts. to 24 cts.
International Traction, Buffalo	21 cts. to 25 cts.	21 cts. to 25 cts.
Rochester	22 cts. approx.	22 cts. approx.
Syracuse	21 cts.	21 cts.
United Traction	.....	.....
Albany and Troy	22 cts.	22 cts.
Schenectady	20 cts. to 25 cts.	20 cts. to 25 cts.

The secretary of the American Street and Interurban Railway Association has furnished the following data which has just been compiled (May, 1907) showing the wages of conductors and motormen in 21 of the largest cities in the United States.

AVERAGE WAGES PER HOUR OF CONDUCTORS AND MOTORMEN.

Name of City.	*Minimum rate in cents.*	*Maximum rate in cents.*
New York (Average of all roads in city of Greater New York)	21.4	23.1
Chicago	24	27
Philadelphia	21	21
St. Louis	23	23
Boston	24.2	25.3

Name of City.	*Minimum rate in cents.*	*Maximum rate in cents.*
Baltimore	18	20
Cleveland	21	24
Buffalo	21	24
San Francisco	31	33
Cincinnati	19	21
Pittsburg	25	27
New Orleans	21	21
Detroit	23	25
Milwaukee	19	23
Washington (Average of two city lines)	21.25	21.25
Newark	19	22
Jersey City	19	22
Louisville	20	22
Minneapolis	21	25
Providence	18.2	22.7
Indianapolis	17	19

The same comparative difference in rates of wages exists for all other classes of street railway labor; so it is seen that American street railways pay practically double the rate for salaries and wages that are paid in the United Kingdom, and this is the most important item of their operating expense.

In the State of New York a decrease of wages to British standard would reduce the operating expenses of local transportation lines about $14,000,000 per annum, an amount equivalent to about 38 per cent. of their gross receipts. As their average receipts per passenger in 1905 were 4.12 cents, it is apparent that if British rates of wages were paid by them they would be as well off if they received an average of only 2.46 cents per passenger, which is only one-fifth of a cent higher than the average paid in the United Kingdom.

The higher rates of taxation in the State of New York and greater costs of essentials to operation make the increase in the other costs per passenger far greater than one-fifth of a cent.

To contrast differences in payments for accidents alone.

According to the Railroad Commissioners' Report of New York for 1906, the total gross receipts from passengers on the street, surface, elevated and underground railways of the state were $77,841,051.

Total passenger car miles run were 307,619,065.

Total damages paid, $2,920,308.

This averages 3.76 per cent. on the total gross passenger receipts and 0.948 of a cent per car mile.

According to the British Parliamentary Report on Tramways and Light Railways of 1906, the total gross passenger receipts on all tramways in the United Kingdom were £10,248,204, or say $49,603,789.

Total car mileage was 244,149,464.

Total compensation for personal injury or accident paid £161,242, or say $787,056.

This averages 1.5 per cent. on the total gross passenger receipts and 0.222 of a cent per car mile.

So that in New York State alone the total amount paid on account of damages was $2,133,250 greater than by all the tramways of the United Kingdom; while the percentages of same to gross passenger receipts was nearly two and one-half times as great and per car mile nearly three times as great.

If the above calculations were extended to all the street railways of the United States, in accordance with the Census figures of 1902, the average receipts per passenger, which would leave the street railways in the same financial position as now from their operation, would be 2.24 cents, arising from the difference in wages alone, or less than the average rate of fare in the United Kingdom; while as already stated the American passenger has facilities for travel available to him many times greater than those existing in the United Kingdom.

The total paid annually by all street railways of the United States for damages now amounts to over $10,000,000.

Turning more directly to British conditions, few Americans realize the obstacles which tramway companies meet in attempting to obtain franchise rights, or the enormous expense to which such companies are subjected in procuring the same.

In most cases the consent of all local authorities affected by the proposed construction of lines must be had before a hearing will be given by either the Board of Trade or Parliament, and in all cases the consent of at least two-thirds of the local authorities must be had.

This power is used by the local authorities to force the companies to make excessive payments for, or assume obligations in connection with public improvements not necessitated by tramway construction.

The obtaining of frontage consents and compliance with other features of procedure is exceedingly expensive; while hearings before the Board of Trade or Parliamentary committees are still more so.

If perchance the company, after overcoming these handicaps, does secure a franchise, it is but for a brief period of years, scarcely long enough to warrant the heavy expenditures required for modern electric railway construction, especially when it is considered that at the expiration of the franchise the municipality can take it over at scrap value.

Against this, municipalities can with little difficulty, and at comparatively slight expense, obtain their Parliamentary rights to construct and operate tramways in perpetuity, with a complete monopoly for all time to come.

If a prominent British municipality wishes to secure Parliamentary legislation favorable to its tramways or other public utilities, and if it wishes to oppose any contemplated legislation un-

favorable thereto or which would result in the creation of any company undertaking, it has at its command a more powerful political influence than exists in the United States.

This through an Association of the Municipalities comprised of several hundred members, which is dominated by the town clerks of the respective municipalities, who are permanent high-salaried officials and who are generally animated by the desire of increasing the importance of their own positions and influence through the municipalization of all public utilities.

In every municipality they either are or can easily become the most powerful political factors, especially as regards Parliamentary matters.

Rarely are members of Parliament residents of the localities from which they are elected and which they represent. They need the strongest possible local support to be elected.

This naturally centers in the municipal governments of their districts, and the town clerks and other permanent municipal salaried officials command this influence far more thoroughly than do the more prominent elective officials of the various municipalities.

So when a town clerk makes a request of a member of Parliament representing his locality the usual result is not unlike what occurs in America when a political boss makes a similar request of some public official whose election he has made possible. With this combined potent influence at work all over the kingdom in favor or against a particular Parliamentary measure, the effect can be readily imagined.

British conditions in this respect are not unlike what would occur in an American state providing the state and local "machines" of all parties were kept constantly united to exert their combined influence on legislation.

The manner in which the municipalities are favored over companies in the tramway field are thus self-evident; on legislation, on capital account from the outset, on operating expenses and in reaping benefits in later years from traffic created or built up by the tramways.

This fact should never be forgotten in comparing British municipal and company tramway conditions or results.

To illustrate some of the facts above stated, brief quotations follow from sworn testimony of prominent gentlemen (see Minutes of Evidence taken by the Royal Commission on London Traffic).

Testimony of Sir Herbert Jeykell, Assistant Secretary of the Railway Department.

"Q. As regards tramways, are not the standing orders of Parliament to the same effect as the provisions of the Tramway Act, 1870, in so far as they require the consents of road and local authorities to be proved?"

Ans. "Quite so; so that the veto is absolute in the case of private bills as in the case of procedure under the Tramway Act."

(Same authority.)

able than actual results secured; but for the purpose of comparison it is necessary to here take the official statements as made in the Parliamentary Report on Tramways and Light Railways, 1906.

United States.

1906.

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This shows that the net return to local public authorities in the United Kingdom is $925 per mile of track, whereas in the United States it averages $1,295.

The difference in favor of the United States on this phase of conditions would naturally be improved if proper additions, amounting to many millions, were made to the capital account of British municipal tramways. While if the great increase in taxable values and returns therefrom arising from the more general development of street railways in America were taken into account, the financial returns to American state and municipal governments would be

demonstrated as enormous; all of which has resulted without the taxpayers being subjected to any risk whatever.

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Barking Urban District Council.
Bexley Urban District Council.
Blackburn.
Cardiff.
Chesterfield.
Colchester.
Darlington.
Doncaster.
Dover.
Erith.
Failsworth, Farnworth and Kearsley Urban District Council.
Gloucester.
Heywood.
Ilkeston.
Ipswich.
Keighley.
Lancaster.
Leyton.
Lincoln.
London County Council—Northern System.
Maidstone.
Matlock.
Nelson.
Plymouth.
Pontypridd.
Rachdale.
Southend-on-Sea.
Southport.
South Shields.
Stalybridge, Hyde, Mossley and Dukinfield.
Swindon.
Walthamstow.
Warringdon.
Wigan.
Kilmarnock.
Kirkcaldy.
Leith.
Perth.
Belfast.

It is thus seen that out of a total of 175 municipally owned tramways and light railways, 40 on the face of their own reports show deficits, and this number would be greatly added to if the accounts of the various municipal undertakings in the United Kingdom were properly kept.

Much credit is taken by the municipalists for the improvement of labor conditions arising from many British tramways coming under municipalistic control.

This subject has been so thoroughly treated in the admirable paper by Professor John R. Commons and Mr. J. W. Sullivan, which will be published as part of the records of this Commission, it is considered unnecessary to dwell on this feature to any great extent other than to say that rates and hours of labor on American street railways have improved comparatively as much from the days of animal traction up to the present as has been the case in Great Britain.

It is also considered well to insert the following comparative table showing rates of wages paid conductors and motormen on certain British tramways and on certain street railways in the State of New York. The figures are from the paper of Messrs. Commons and Sullivan and the New York Railroad Commissioners' Reports.

System.	*Conductors, rates per hour.*	*Motormen, rates per hour.*
Glasgow	11.2 cts. to 13.9 cts.	11.2 cts. to 13.9 cts.
Manchester	11 cts. to 13.5 cts.	11.5 cts. to 14 cts.
Liverpool	10 cts. to 12 cts.	12 cts. to 13 cts.
London County Council.	11.6 cts. to 15 cts.	11.4 cts. to 15 cts.
London United	9.6 cts. to 12 cts.	12 cts. to 14.4 cts.
Dublin	7.2 cts. to 9.84 cts.	8.4 cts. to 11.14 cts.
Norwich	7.5 cts. to 9 cts.	9 cts. to 10 cts.
New York City Ry.	20 cts. to 25 cts.	22.5 cts. to 24 cts.
International Traction, Buffalo	21 cts. to 25 cts.	21 cts. to 25 cts.
Rochester	22 cts. approx.	22 cts. approx.
Syracuse	21 cts.	21 cts.
United Traction	.....	.....
Albany and Troy	22 cts.	22 cts.
Schenectady	20 cts. to 25 cts.	20 cts. to 25 cts.

The secretary of the American Street and Interurban Railway Association has furnished the following data which has just been compiled (May, 1907) showing the wages of conductors and motormen in 21 of the largest cities in the United States.

AVERAGE WAGES PER HOUR OF CONDUCTORS AND MOTORMEN.

Name of City.	*Minimum rate in cents.*	*Maximum rate in cents.*
New York (Average of all roads in city of Greater New York)	21.4	23.1
Chicago	24	27
Philadelphia	21	21
St. Louis	23	23
Boston	24.2	25.3

Name of City.	*Minimum rate in cents.*	*Maximum rate in cents.*
Baltimore	18	20
Cleveland	21	24
Buffalo	21	24
San Francisco	31	33
Cincinnati	19	21
Pittsburg	25	27
New Orleans	21	21
Detroit	23	25
Milwaukee	19	23
Washington (Average of two city lines)	21.25	21.25
Newark	19	22
Jersey City	19	22
Louisville	20	22
Minneapolis	21	25
Providence	18.2	22.7
Indianapolis	17	19

The same comparative difference in rates of wages exists for all other classes of street railway labor; so it is seen that American street railways pay practically double the rate for salaries and wages that are paid in the United Kingdom, and this is the most important item of their operating expense.

In the State of New York a decrease of wages to British standard would reduce the operating expenses of local transportation lines about $14,000,000 per annum, an amount equivalent to about 38 per cent. of their gross receipts. As their average receipts per passenger in 1905 were 4.12 cents, it is apparent that if British rates of wages were paid by them they would be as well off if they received an average of only 2.46 cents per passenger, which is only one-fifth of a cent higher than the average paid in the United Kingdom.

The higher rates of taxation in the State of New York and greater costs of essentials to operation make the increase in the other costs per passenger far greater than one-fifth of a cent.

To contrast differences in payments for accidents alone.

According to the Railroad Commissioners' Report of New York for 1906, the total gross receipts from passengers on the street, surface, elevated and underground railways of the state were $77,841,051.

Total passenger car miles run were 307,619,065.

Total damages paid, $2,920,308.

This averages 3.76 per cent. on the total gross passenger receipts and 0.948 of a cent per car mile.

According to the British Parliamentary Report on Tramways and Light Railways of 1906, the total gross passenger receipts on all tramways in the United Kingdom were £10,248,204, or say $49,603,789.

Total car mileage was 244,149,464.

Total compensation for personal injury or accident paid, £164,342, or say $787,058.

This averages 1.6 per cent. on the total gross passenger receipts and 0.322 of a cent per car mile.

So that in New York State alone the total amount paid on account of damages was $2,133,250 *greater than by all the tramways of the United Kingdom;* while the percentages of same to gross passenger receipts was nearly two and one-half times as great and per car mile nearly three times as great.

If the above calculations were extended to all the street railways of the United States, in accordance with the Census figures of 1902, the average receipts per passenger, which would leave the street railways in the same financial position as now from their operation, would be 2.24 cents, arising from the difference in wages alone, or less than the average rate of fare in the United Kingdom; while as already stated the American passenger has facilities for travel available to him many times greater than those existing in the United Kingdom.

The total paid annually by all street railways of the United States for damages now amounts to over $10,000,000.

Turning more directly to British conditions, few Americans realize the obstacles which tramway companies meet in attempting to obtain franchise rights, or the enormous expense to which such companies are subjected in procuring the same.

In most cases the consent of all local authorities affected by the proposed construction of lines must be had before a hearing will be given by either the Board of Trade or Parliament, and in all cases the consent of at least two-thirds of the local authorities must be had.

This power is used by the local authorities to force the companies to make excessive payments for, or assume obligations in connection with public improvements not necessitated by tramway construction.

The obtaining of frontage consents and compliance with other features of procedure is exceedingly expensive; while hearings before the Board of Trade or Parliamentary committees are still more so.

If perchance the company, after overcoming these handicaps, does secure a franchise, it is but for a brief period of years, scarcely long enough to warrant the heavy expenditures required for modern electric railway construction, especially when it is considered that at the expiration of the franchise the municipality can take it over at scrap value.

Against this, municipalities can with little difficulty, and at comparatively slight expense, obtain their Parliamentary rights to construct and operate tramways in perpetuity, with a complete monopoly for all time to come.

If a prominent British municipality wishes to secure Parliamentary legislation favorable to its tramways or other public utilities, and if it wishes to oppose any contemplated legislation un-

favorable thereto or which would result in the creation of any company undertaking, it has at its command a more powerful political influence than exists in the United States.

This through an Association of the Municipalities comprised of several hundred members, which is dominated by the town clerks of the respective municipalities, who are permanent high-salaried officials and who are generally animated by the desire of increasing the importance of their own positions and influence through the municipalization of all public utilities.

In every municipality they either are or can easily become the most powerful political factors, especially as regards Parliamentary matters.

Rarely are members of Parliament residents of the localities from which they are elected and which they represent. They need the strongest possible local support to be elected.

This naturally centers in the municipal governments of their districts, and the town clerks and other permanent municipal salaried officials command this influence far more thoroughly than do the more prominent elective officials of the various municipalities.

So when a town clerk makes a request of a member of Parliament representing his locality the usual result is not unlike what occurs in America when a political boss makes a similar request of some public official whose election he has made possible. With this combined potent influence at work all over the kingdom in favor or against a particular Parliamentary measure, the effect can be readily imagined.

British conditions in this respect are not unlike what would occur in an American state providing the state and local "machines" of all parties were kept constantly united to exert their combined influence on legislation.

The manner in which the municipalities are favored over companies in the tramway field are thus self-evident; on legislation, on capital account from the outset, on operating expenses and in reaping benefits in later years from traffic created or built up by the tramways.

This fact should never be forgotten in comparing British municipal and company tramway conditions or results.

To illustrate some of the facts above stated, brief quotations follow from sworn testimony of prominent gentlemen (see Minutes of Evidence taken by the Royal Commission on London Traffic).

Testimony of Sir Herbert Jeykell, Assistant Secretary of the Railway Department.

"Q. As regards tramways, are not the standing orders of Parliament to the same effect as the provisions of the Tramway Act, 1870, in so far as they require the consents of road and local authorities to be proved?"

Ans. "Quite so; so that the veto is absolute in the case of private bills as in the case of procedure under the Tramway Act."

(Same authority.)

Testimony of Sidney Morse, Solicitor.

Q. "You say that the existence of the Tramways Acts has led the Light Railway Commissions to give the local authorities very like a veto?"

Ans. "Yes, they have given them absolutely a veto in many cases, although the Light Railway Act merely states that the local authorities are to be considered. Section 7 states that the commissioners are to satisfy themselves that all reasonable steps have been taken for consulting the local authorities, including the road authorities, through whose areas the railroad is intended to pass. Now I can tell you of a case where I was representing the promoters where they had gone to the length of agreeing terms with a corporation, but at last moment the corporation left us and asked a neighboring corporation to make a better proposal to them. At the inquiry which took place immediately, the only objection to our scheme was that of the local authorities who simply stated they objected to a company, and notwithstanding that the commissioners expressed their opinions that the corporation were not acting in a reasonable manner, the order was refused simply on the objection of the local authority. The terms they got from the neighboring corporation were the same as the terms they had agreed with the company except for sealing them. I think I am bound to put it to you that the commissioners not only hold but consider they are bound to hold that so long as provisions of the Tramways Act are on the statute book they are bound when dealing with light railways on roads to consider the local authority as practically having a veto."

Q. "Do you think that the veto given to local authorities by that act has discouraged the construction of tramways?"

Ans. "I could give you endless instances in my own experience. You not only have to get the consent of the local authorities to construction but you have to get the consent, for example, to alteration from horse traction to electric traction, because the earlier powers did not give electric traction as a power. I was acting for a company which proposed to buy up several groups of tramways and spend a million of money in electrically equipping them and extending them. We had got the consent of a majority of the local authorities and the scheme was absolutely prevented by the veto put upon us by one of the larger authorities; and that is only one of the endless instances."

Q. "Can you give any instance in London or within twelve miles of London?"

Ans. "Yes. Of course in London itself no company has been able for some years to get tramways because of the veto. I personally have not been concerned in promoting tramways in London; but an example with regard to London I may take from Mr. Burns' speech in the House in May of last year. I do not know whether that is before you. You will remember that it was proposed that standing order 22, which gave the local authorities a veto, should be amended; a motion to that effect was brought up on the 15th of

May of last year and in the discussion on that motion Mr. John Burns said this: 'In three sessions thirty-eight proposal for tramway extensions and improvements have been vetoed by the Borough Councils in London.'"

Q. "Then you say that the purchase clause as to tramways has impeded the construction of tramways?"

Ans. "Yes. I think there is no doubt about that, and then when a line has been constructed the existence of the purchase clause has been very detrimental, particularly after the first ten or twelve years' life of the undertaking."

Q. "The limit of time is twenty-two years is it not?"

Ans. "It is twenty-one years under the Tramways Act from the date when the line is authorized so that there is really only about nineteen years of working."

(Same authority.)

Testimony of J. W. Benn, member of the London County Council; a strong advocate of municipal ownership.

Q. "Therefore the result of the present standing order and the present veto is that no voice can be heard?"

Ans. "No company voice can be heard; everybody else can be heard."

Q. "No company voice can be heard in the discussion of any tramway scheme?"

Ans. "Quite so. Everybody else, frontagers, borough councils, all sorts of people, gas companies, railway companies and so on can be heard."

(Same authority.)

Testimony of Mr. Arnold Frank Hills, Chairman of the Thames Iron Works, Shipbuilding and Engineering Company, of Blackwell.

Q. "Do you think that the municipal purchase clause in the case of tramways ought to be abolished?"

Ans. "That is my own private opinion."

Q. "Do you think that the purchase clause in the matter of tramways has resulted in this country being very much behind other countries in the development of electric and other tramways?"

Ans. "That is admitted."

Q. "Do you think that the developing authority should be given power to dispense with the veto of public departments?"

Ans. "Of course that question of veto is a sort of relic of forty or fifty years ago, when it was quite right the local authorities should have power to say they did not want a thing; but if you had a tribunal such as I suggest for considering all these questions, those questions could be considered and the locality would have its right of opposition in Parliament, so that they would retain their privilege of being heard; but it seems a pity that at the beginning of a scheme a local authority can, as it were, put itself up to market to be bought out, or stop the whole thing by a veto."

(Same authority.)

Testimony of Sir R. D. M. Littler, Chairman of the County Council of the County of Middlesex. (Paragraph 15,875-6).

Q. "As far as one can see, if it were not for the local veto tramways would be provided wherever they were required whether there was a board or not?"

Ans. "Yes; I think so. I think that local veto is a thing which has been so abused that it is a great question whether it ought not to be abolished altogether; it certainly ought to have very strong limits. Parliament ought to be able to override it. It might be well that it should be shown before a committee of Parliament that a local body objected, but then they ought to give their reasons for it."

Q. "The point I was coming to was this, that apparently, if it were not for the operation of the local veto tramways would be built wherever they were required whether there was a board or not?"

Ans. "I think so."

Q. "You say that the results of the veto is illustrated by the history of the western roads, especially at Brentford?"

Ans. "There, there is an illustration which is rather a remarkable one at the present moment, and that is there is a proposal whether it will be carried out or not, I do not know, because there are a great many important considerations to cross the new bridge which has been constructed by the counties of Surrey and Middlesex, which is now called King Edward VII. bridge, between Kew and Brentford. A bit of the approach on the north side is in Brentford. The Brentford people entered into what I think was a very imprudent arrangement long ago with the tramways company as to their road, and as to what was to be paid for the widening of their road. Now in consequence of there being this little piece through Brentford what they were asking the tramway company to do is to widen the whole of the high street of Brentford from one end to the other to 80 feet, which I suppose would cost £200,000 at least. They are also asking that they should provide a public urinal in this 100-yard bit. They are also asking for a passenger subway from one end of the bridge approach to the other to be maintained and lighted at all times, and that in consideration of their concession the company are to pay a contribution of £1,000 per year."

Q. "Is that the price of removing the veto?"

Ans. "That is the price of removing the veto. Brentford is one of my district councils and I have no desire to speak disrespectfully of Brentford, but it does seem to me to be somewhat high priced to ask for the right. There is a tramway already perhaps within a hundred yards of the foot of the bridge in the Brentford district and all the United London Tramways Company want is consent for a bit to the foot of the bridge because the moment they get to the foot of the bridge they have to get the consent of Middlesex as the bridge belongs to us; but for that consent Brentford proposes to ask the various things which I have

mentioned. That is an illustration, I think, of what very often happens. One does find that sometimes in Parliamentary bills one year a veto is absolutely opposed and the next year by some mysterious means, which nobody knows, it gets removed."

Q. "Do I understand that you think the veto by District Councils has been very frequently abused?"

Ans. "I am sure it has."

Q. "And that it is liable to be made a weapon of practical extortion?"

Ans. "Certainly. It has certainly been abused and is liable to be made an absolute weapon of extortion."

(Same authority.)

Testimony of Mr. J. E. Waller, a member of the Institute of Civil Engineers. (Paragraphs 16,102-3.)

Q. "So far as tramways are concerned, if there were no local veto there would be no great difficulty in preparing a general scheme for London, would there—not an absolutely final scheme, but a scheme laying down everything proposed to be done in the first instance?"

Ans. "No; giving it consideration, I do not suppose there would."

Q. "So far as the tramways are concerned?"

Ans. "As far as the tramways are concerned."

(Same authority.)

Testimony of the Right Honorable J. W. Lowther, Member of Parliament, Deputy Speaker of the House of Commons, Chairman of the committees.

Q. "Do you think the standing order has been used for purposes which were outside anything contemplated by Parliament?"

Ans. "I think it has been most improperly used. It has been used to get all sorts of terms and conditions out of the tramway companies and has subjected them to all sorts of liabilities and disabilities which were never contemplated by Parliament when the standing order was passed; it is also used collusively to defeat the intentions of Parliament."

Q. "With regard to the veto, I believe you said that from past experience you felt that Parliament would be very reluctant to take away the power which local authorities have to veto?"

Ans. "The local authorities are so strong in Parliament now that I do not think there is much chance of doing away with it."

Q. "The opposition representing perhaps not so much an individual opinion of members of Parliament but the combined pressure of separate bodies wishing to retain their own vetoes?"

Ans. "I think the Municipal Corporations' Association (which I think is the proper name of the body) brought great pressure to bear on the borough representative in all parts of the kingdom to oppose the proposition. They have this powerful organization and they have their men there."

(Same authority.)

Testimony of Mr. W. R. Jeffreys, Honorary Secretary of the Roads Improvement Association.

Q. "The local authorities, having a right to veto, are able to dictate their own terms to the tramway companies, are they not?"

Ans. "Yes. For example, they require things apart from the roads. I do not think that in using their power of veto to secure necessary road widenings they are exceeding their rights, but frequently I believe the local authorities ask for other things, such as erecting a public convenience or lighting their roads or matters of that kind; I venture to suggest that any conditions that are imposed upon a tramway company should be in the direction of widening or improving the roads."

(Same authority.)

APPENDIX X.

Testimony of Stephen Sellon, member Institute Civil Engineers.

1. Procedure:

There are three methods by which powers may be obtained for the construction and working of tramways, viz.:

By Provisional Order.

By Light Railway Order.

By Private Bill.

Costliness is common to all.

The enormous amount of money wasted in the promotion of undertakings goes a long way to discourage or deter schemes of undoubted public utility being introduced.

If introduced the temptation to buy off opposition by accepting detrimental clauses is very great.

A method of cheapening present procedure is essential to proper development.

Tramway bills are frequently blocked by the demands that cannot be granted and frequently the consents are purchased at a price that compels over-capitalization, and cripples the public utility of the undertaking. Beyond this preliminary difficulty the double contest before committees of the two Houses make the passage of an opposed bill unduly expensive. The large number of opponents who are given a locus also adds another source of immense expense.

These opponents include railway companies, gas, water, telephone and electric supply owners, frontagers, and land owners. The latter have a general locus to oppose the whole of any scheme although they may be only affected by a small part of it.

The veto is given to local and road authorities by section 5 of the Tramways Act, 1870, and is applied to private bills procedure by standing order 22 of both Houses; in both cases both the local and road authorities for two-thirds of the length of a tramway must consent to its construction. Failing such consent the Board of Trade can make no order and no bill can come before Parliament.

The effect is that the necessary consents have to be purchased by promoters, the only limit to the terms being the ingenuity of the local authorities and squeezability of the promoters. The price of consents has been constantly increasing and at present it is so high in many cases as to effectually bar promotion by those who intend to carry out their powers and have to consider the commercial prospects of the undertaking. Speculative promotion is not so much discouraged by these conditions.

The terms commonly take some of the following forms:

(1) Street widening and improvements at cost of promoters.

(2) Contributions to public buildings.

(3) Agreements to purchase power from local authorities at exorbitant prices.

(4) Payment of portion of profits earned even on lines outside of the territory of the consenting authority.

(5) Agreement to surrender the powers or else the constructed lines to local authorities at cost price and to take a lease of them on terms, putting whole risk of loss on promoters, reserving to local authorities the bulk of the profits as the lines develop.

(6) Agreements to contract for paving maintenance at rates giving the profits to local authorities.

(7) Insisting on additional onorous terms as a price of formal consent even after entering into agreement to aid the promotion.

(8) Insisting on payment of local authorities expenses, even in opposing the promotion in future stages.

It is submitted that insistence on such terms is a legalized form of blackmail which is entirely against the public interest and was never intended by Parliament. The power has been most seriously abused and this experience shows that a veto without appeal cannot be trusted to local authorities.

The evil effects of compelling a tramway company to spend more money on the construction of its lines than is necessary for efficiency and economical working must be felt by the public served.

Compelling a company to buy its power for the whole term of its tenure at a price which is even now much in excess of a reasonable figure may be a most serious burden and may very likely operate as a denial of the benefits of scientific progress, not merely to the company's shareholders but to the fare-paying public.

It is indeed tolerably certain that whatever benefits the constituents of those misguided authorities may appear to receive as rate payers they will dearly pay for, as tramway travelers.

I agree that local and road authorities are entitled to be fully heard in the interests of their districts and that it may be their duty to oppose "wild cat" or objectionable schemes, but I submit that such objections would be considered by an impartial tribunal who will decide the matter on the broad grounds of general public interest, and that no terms amounting to money payment or its equivalent should be permitted.

In London especially it is necessary that none of the twenty-nine road authorities should be permitted to block schemes vitally

necessary for the health and comfort of the whole population. Nor do I regard it as proper that the London County Council should have an absolute veto.

It has been led by circumstances, not of its own making, to regard its own interest as a tramway owner and it has therefore either refused consent or imposed exorbitant or unreasonable terms of consent, thus impeding necessary extensions of lines from outside its area.

Its action is a good example of a difficulty of combining governing and trading functions, even with the best intentions.

The benefit of the abolition of the veto is shown by the success of the Light Railways Act procedure despite the drawbacks above mentioned. Under this act, one company alone has promoted and constructed 131 miles of line. The interests of the rate payers and their representatives have been very fully protected in all these cases.

The kind of requirements put upon promoters under these veto powers include the following:

Insistence upon unduly expensive or unsuitable paving material, such as a particular kind or special shape of stone sett, which may be specially expensive, difficult or expensive, to get at the rate required for the construction, or unsuitable for the depth of rail, the amount of traffic, etc., or the use of hard wood blocks (always objectionable to tramways) under unfavorable conditions.

Insistence by the authorities' officers on unnecessary, unusual and expensive methods of workmanship.

Requirements of elaborate design and unsuitable position or kind of posts and brackets carrying overhead wires, and of position of feeder cables and boxes in the streets.

I have had the construction of tramways stopped for twelve months because I was required to use a class and size of sett unobtainable.

I have had to pay £1,000 to a local authority for permission to use a 5-inch x 4-inch sett, which I could get instead of a 6-inch x 3-inch, which they demanded and I could not procure.

I have frequently had the progress of construction delayed for many months owing to the refusal of a local authority to approve the rails proposed and the construction plans which have been passed by the Board of Trade.

I have had to agree to pave 27-inch margins to a tramway though the act required only 18-inch.

I have had to use a different class of sett on one line in each of three or four districts through which it passed.

These requirements are not merely directly expensive to meet, but indirectly costly by reason of delay, and also by the impossibility of arranging for stocks of material or steady supply from the merchants.

Terms of Purchase.

I have already mentioned the purchase terms of the Tramway Act, 1870 (section 43), as largely responsible for the slow development of tramways in this country, and in London especially.

The companies could by no means spend the large capital required for electrical equipment, with the prospect of clearing revenue therefrom for a very few years, and then selling the whole at less than cost price.

Similar considerations operate to prevent any tramway being brought up to date or kept in first class order as the end of the tenure approaches, and thus the interest and convenience of the traveling public, as well as the property of the shareholders, are sacrificed to enable the rate payers to acquire a business at less than its commercial value. The capital expenditure on a modern electrically equipped tramway is very much greater than on a horse tramway of thirty years ago. Even the permanent way is much more costly. The electrical equipment, the generating station and the larger and heavier cars all add greatly to the expense. It is fair to say that the capital invested is three times as great now as when the act of 1870 was passed.

Further, economical working requires that the plant and the way be kept up to a high standard of excellence; in fact, an electric tramway had to be maintained up to very nearly new value.

For these reasons the sacrifice of the owners' capital upon purchase, under section 43, is much more serious in extent and it is impossible in the majority of cases to see prospect of accumulating a sufficient reserve fund during the tenure of twenty-one years to cover that loss, investment is thus greatly discouraged.

An increase in the length of tenure as well as fair terms of purchase are necessary to encourage the best class of investors, as these seek permanence as well as security and reasonable returns.

The inoperativeness of the electric lighting act, 1882, with its twenty-one years' tenure, and the activity following on the amending act of 1888, giving double the period, illustrate this point.

Besides the short initial term the recurrence of the purchasing power every seven years is a drawback of the same kind and greater intensity.

In the public interest alone, it would appear desirable to grant such terms as to induce the proprietors to keep their undertaking thoroughly modernized and efficient, and it is submitted that the public interest and the claims of equity coincide in prescribing the unexhausted value of the undertaking as a going concern, as a suitable definition of the purchase price; and it is further suggested that the assessment of the undertaking for rating might well be made the basis for this purpose so far as the fixed property is concerned.

The argument used as justifying the "then value" purchase terms, is that the tramway owners have had the use of the streets for their tenure, and any going concern is a part payment for that use. It is apparently forgotten that they are large rate payers and that they save the rates the whole maintenance of the carriage way covered by their track and its margins; but, however this may be, the price demanded is too high and the capitalists will not accept the terms.

(Same authority.)

APPENDIX II.

Testimony of Sir J. Clifton Robinson, Managing Director of the London United Electric Tramways.

In regard to the nature of the demands sometimes made by local authorities as conditional to their assent being given to new proposals, I think that considering the vast benefits which they confer, alike on localities and on the public, tramways are heavily handicapped by the exactions of local authorities in respect to road widenings and public improvements. It is not too much to say that from first to last I have had to negotiate with some thirty local authorities in the large territory which is now covered, or will soon be covered, by the London United Tramways. It would have been impossible for such a tramway system to have been laid down had each district sought to own its own little fragment of line. In reading a paper to the Society of Arts two years ago, I showed how impracticable such a thing would have been. "Each little Peddlington," I said, "would have its staff of parliamentary agents, engineers and contractors; each would demand its share of the profits, if any could arise from such a hugger-mugger of ownership and management. The accounts would be voluminous and their accuracy would be practically impossible, while the host of officials would be as disastrous to the revenue as a cloud of locusts to a green crop." The picture I thus presented emphasizes my plea that our own or any similar enterprise which aims at doing what a group of local authorities could not, as I have said, do efficiently for themselves, should receive every consideration and aid from such local authorities; but my own experience does not suggest that such consideration and aid are really shown. In the construction of our lines we have had to expend an enormous sum of money on street and bridge widenings, etc., not essential to the tramway though distinctly beneficial to the public both local and general. In his evidence on February 5, Sir Ralph Littler, Chairman of the Middlesex County Council, referred to the mysterious way in which a veto interposed one year and disappeared the next. He suggested that I might supply the key. It is to be found in the exhibit I now put in, headed, "The Price of Local Authorities Assents." This exhibit illustrates the growth of the rapacious demands enforced by local authorities. Briefly stated, it shows that the exactions made upon in respect to our bills in the years 1898, 1900, 1901, 1902 and 1903 for street widenings and improvements represented an outlay of £745,500 apart from the capitalization of numerous way-leaves which amounted to a further £241,000 or over £20,000 per mile of tramway, irrespective of construction and equipment. At first recognizing that we derive some indirect advantages from public improvements which were not directly necessary for our purposes we acceded to the demands. But these have latterly grown until in the case of our bill of 1904—the main proposals of which have had to be dropped in consequence of the extortionate prices placed by the local authorities on their assets—we were asked to carry out on

some 21 miles of urban tramway public improvements costing £642,630, in addition to widening works costing £217,932 to which we perforce had to agree, representing a total of £860,562. I need not specify that Brentford demands, with which Sir Ralph Littler has dealt; but I may mention that the requirements of the urban district council would have raised the total estimated cost of widenings, in respect to the Brentford district to £608,805. This seems incredible, but the mileage within the jurisdiction of Brentford was only about six furlongs, while, as the price of assent to this short extension the district council coolly suggested our dismantling practically the whole length and breadth of the High street, through which it was not proposed to lay one yard of additional tramway. The proposed extensions which have had to be abandoned by the London United Electric Tramways, owing to the attitude of the local authorities, represent a total of something like 60 route miles, many of these lines (as shown by the diagram which I put in) being of such a character that they would have been of great practical utility in solving the problem of London traffic needs.

Then, as a final burden, we have in most cases to pay wayleaves for the use of the roads we so maintained.

I venture to affirm that if the cost of construction of our tramways had not been swollen so greatly by the exaction of local authorities we should have been well able on various parts of our system to carry passengers either at lower fares than we now charge or alternatively longer stages for the same amount.

Much similar testimony to the foregoing was given by others before the Royal Traffic Commission, as well as before the Parliamentary hearings on Municipal Trading in 1900 and 1903.

Great as is the power of local authority to place burdens on tramway companies, as shown above, in the construction and operation of their own tramway projects, they have frequently followed the practice of omitting from the capital account large sums which should have been charged thereto, and causing these expenditures to be unjustly carried into the general accounts of the cities, and they have similarly favored the operating expenses of their tramways.

As is shown by voluminous testimony in the reports of the Parliamentary investigations of Municipal Trading, and as evidenced by the recommendations of the Parliamentary committee which conducted such investigations in 1903, no power of audit exists over the accounts of municipalities which can prevent them from distributing expenditures to any account which they see fit, the functions of both national and local auditors being simply to see that vouchers agree with accounts and that books balance.

The financial experts of this commission, Messrs. E. A. Turner and R. C. James, had no opportunity in their investigation of seeing whether or not a proper distribution had been made in the accounts of the undertakings which they investigated.

They state in their schedules as follows: "All figures in these schedules relating to assets, liabilities, revenue and profit

and loss accounts are prepared from the published accounts certified by the auditors. We have in all cases, where further information was required, obtained such details from the staff of the undertaking. *We have not in any case verified by personal examination the accuracy of the audited accounts, as we considered that in the short time at our disposal we should not have been able to do this with any completeness even had we entree to the books and original records.*"

In view of what has been recited and of what follows, little faith can be placed in the liability of British municipal tramway accounts.

W. H. Dickinson, Alderman and Member of the London Council, testified before the Royal Traffic Commission, as follows:

(See Minutes of Evidence, paragraph 2195, and subsequent paragraphs.)

"The London County Council in all its tramway work has been very much impeded by the difficulties of the question of street widenings, and especially the question as to who should pay for them. We have laid down a rule as far as possible, and we do not wish to depart from it, in justice to all parts of London; that is, that one-third of the cost is paid by the council, one-third by the tramways department and one-third by the local authority."

That is, only one-third of the expense has been charged to the capital account of the municipally owned tramways, while the other two-thirds is paid for out of public funds raised from taxation by the London County Council and the boroughs of Greater London, or carried in their general debt obligations.

Sydney Morse, Solicitor, testified before the Royal Traffic Commission (see paragraph 3218), as follows:

"I do not know whether the Commission are aware that when corporations construct tramways and carry out street widenings in order to enable them to work their tramways more beneficially, they do not charge the whole, or in some cases any part of the widening expenditure to tramways at all. The most important example of that is Leeds, where they spent £300,000 in street widenings, not one sixpence of which is charged to the tramway account."

(The same witness, paragraph 3320.)

"I feel that the accounts and the methods of allocating moneys spent on widenings should be the same all through. We have to-day the local authorities charging the widenings to one account and the tramways to another account and then showing the profit on the tramways, whereas a company has to put everything to the same account and it is not a fair comparison."

J. W. Benn, Member of the London County Council, testified before the Royal Traffic Commission (see paragraph 5468), as follows:

"Now the tramways are occupying the streets we have amended that arrangement, and we offer, if the local authority will find a third of the money, to carry two-thirds, the money

being divided between the improvements account of the council and the tramways."

Owing to the narrow streets in most British cities the construction of new lines of tramways has, almost without exception, necessitated many street widenings. In this connection, municipally owed tramways have been especially favored, as has already been referred to.

While the members of the Commission were in Great Britain, and at previous and subsequent meetings of the City Council of Liverpool, it was made officially apparent that the total cost of street widenings and improvements necessitated by the construction of the municipal tramways there, had been slightly over £1,000,000, practically all of which is carried in a general public loan for street improvements.

In the Parliamentary Report on Tramways of April 6, 1905, the expenditures for this purpose by the Liverpool tramways is shown to be only £9,857.

At a meeting of the London County Council held October 16, 1906, the fact was ascertained that no less than £4,044,844 had been expended by the council on account of the tramways, of which only £377,260 had been charged to the tramway capital account. The total capital account of the London County Council, according to the Parliamentary Return of 1906, is £4,188,095, so it is seen that there had been buried in other accounts expenditures in behalf of the tramways amounting to within about £4,000,000 of the entire capital tramway account.

At the discussion following this expose, Captain Swinton, a prominent member, brought out the fact that since the council had entered the tramway field, the expenses of the general office had amounted to about £1,200,000, of which there had been charged to the tramway accounts £8,160, and stated that in his opinion on this feature alone the council's tramway undertaking owed the people of London at least £500,000. This is a larger sum than has been shown as the net earnings of the properties even by the juggled accounts of the London County Council. (See London Times and other London papers, October 17, 1906.)

Commenting on this condition the London Times of February 26, 1907, states as follows:

"The tramway accounts have been 'written down,' like the housing accounts, by the omission of charges for street widening, for annual depreciation, and for the services of other departments. Usually when streets have to be widened for the purpose of tramways, the cost is charged against the tramway. That is done in the case of tramway companies in and about London. The council invented a plan of its own, by which only one-third was to be charged to the tramway, and the rest put upon the rates; but even this has not been carried out. The government auditor found (April, 1906) that a total amount of £89,305 had been charged to the tramways account for street widening; but 'the total sum estimated to be chargeable to the tramways account' for street

widening was £377,260, and this represented, roughly, one-third of the net cost. Apparently, therefore, street improvements have been undertaken for tramway purposes at a cost of about £1,100,000, of which £90,000 only has been charged against the tramway account. No one will ever know what those tramways have really cost. With regard to depreciation it is enough to say that on about the same capital expenditure Glasgow allows £200,000 a year for depreciation, the London County Council has recently allowed £35,000. This is the maximum; in some years it has allowed nothing at all. There is not the slightest doubt that if the council tramways were treated financially as others are they would show a very large annual deficit."

For street widenings, etc., Manchester shows, as charged to its tramway capital, but £11,588; Glasgow, nothing; Bradford, £8,827; Derby, nothing; Ruddersfield, nothing; Hull, nothing; Leeds, nothing; Nottingham, nothing; Oldham, nothing; Plymouth, nothing; Portsmouth, nothing; Preston, nothing; Southampton, nothing; Southport, £3,327; Wolverhampton, nothing; Belfast, nothing.

The total charges to capital accounts of municipal tramways for this purpose, for the entire kingdom, as shown by the Parliamentary Return of 1906, is but £750,092 or only £5,000 more than Sir J. Clifton Robinson has testified that the London United Electric Tramways Company was alone compelled to pay for similar purposes, to say nothing of the financial obligations which it has assumed as regards paying a large annual charge for way-leaves.

The total paid-up capital of the municipal tramways, in accordance with the Parliamentary Report of 1906, was £35,423,947.

If the proportionate expenditures of all for street improvements charged to other accounts throughout the kingdom, have been as great as those of the London County Council, this sum should be practically doubled, or would reach say £70,000,000.

The total paid-up capital of the Liverpool tramways is £1,666,402. If the expenditures of all other municipal tramways in the kingdom for street improvements, which have been charged to other accounts, have been proportionate to those of Liverpool, then about 62½ per cent. should be added to their capital accounts, which would make the proper total thereof for the United Kingdom, say £57,500,000.

It is almost needless to remark that if all of the accounts of the municipal tramways of the kingdom, their operating expenses have been favored as greatly at the expense of general funds, as has been shown to be the practice of the London County Council, then all their boasts of economical operation must disappear and deficits appear in place of apparent profits from operation.

Against such a condition as has been recited, the accounts of all company tramways in the kingdom, under the law, must be thoroughly audited and proper distribution thereto certified by chartered public accountants.

According to the Parliamentary Tramway Return of 1906, the total paid-up capital of the municipal tramways was £35,423,-947. These had 2,499 miles of track open for traffic, which is a capitalization approximately of £4,069 per mile of track.

The paid-up capital of the tramway companies was £22,514,-470. Their miles of track were 1,084, making £20,493 per mile of track, an unfavorable showing for companies on its face.

Were municipal capital accounts corrected, however, in accordance with the above, the comparison in this respect would then not be unfavorable to the companies, especially when their serious disadvantages and handicaps are considered.

The car mileage of the municipal trams was 154,965,781.

That of the companies, 89,183,383.

Car miles per mile of track: municipal, 62,011; company, 82,273.

This demonstrates that despite the fact that the municipalities have with few exceptions acquired the best properties of the kingdom, they are giving a service about 25 per cent. less frequent than is given by the companies.

Or state it in another way, the average headway between cars on the municipal lines on a 24-hours' basis is approximately 8.1 minutes, while upon those of the company it is but 6.3 minutes.

This of course demonstrates that the companies operate a more frequent service, at a consequently greater expense, to accommodate their patrons than do the municipalities.

The total gross receipts of the municipal tramways were £6,853,486 for the year.

The operating expenses, including taxes but not rental of leased lines, amounted to £4,323,734.

The net receipts were £2,529,752.

The percentage of operating expenses to gross receipts was 63.1 per cent.

The gross receipts of the companies were £3,789,692.

The operating expenses, including taxes but not rental of leased lines, amounted to £2,512,029.

The net earnings were £1,277,663.

The percentage of operating expense to gross receipts was 66 per cent.

In view of the manner in which the municipal tramways are favored in their showing on operation by charges to other public accounts, and of the superior service operated by the companies, the latter are to be congratulated upon the showing thus made.

The gross receipts per car mile in the municipal tramways were 10.62 pence, or 21.24 cents.

The operating expenses were 6.69 pence, or 13.38 cents.

The gross receipts per car mile of the company tramways were 10.9 pence, or 20.18 cents.

The operating expenses were 6.73 pence, or 13.46 cents.

Considering the additional burdens of expense borne by the companies, comparison with the favored accounts of the municipal

tramways certainly demonstrates that were actual results from operation shown by the municipalities, the superior management of the companies would be clearly demonstrated.

The average receipts per passenger of the municipal tramways was 2.1 cents. By the tramway companies, 2.41 cents, but as the companies are running an average service nearly one-third more frequent than that of the municipalities, the companies are certainly entitled to this small difference in fare.

Those who advocate municipal ownership and operation of American local transportation lines invariably attempt to befog their readers on the question of rates of fare charged on British tramways, giving the impression that these are much lower than they actually are.

It is true that rates of fare are lower in Great Britain than in this country, but the distances which may be ridden for such fares are also very much shorter, which fact is not generally stated by the advocates of municipal ownership.

In considering the comparative advantages of the universal five cent fare, with transfer privileges, prevailing on American street railroads with the graduated system of fares followed throughout the United Kingdom, it should be done from both the standpoint of operation, *i. e.,* financial return, and also from the standpoint of benefits derived by the public.

We, as experts, do not hesitate to say that should the street railways of the United States adopt a graduated fare, there is no question but what their returns from passenger traffic would be larger than at present, for there would then be no free transfers, and each passenger would pay proportionately to the distance which he rides, thus enormously increasing the short haul traffic which every railway man knows is the most profitable.

If due allowance were made for high rates of wages and other essentials to operation in the United States, particularly as regards supplies, taxes, and damage accounts, American graduated fares could easily be made comparable with those prevailing in Great Britain, or even lower.

In fact where an approach has been made in America toward adopting the graduated fare principle, to-wit, upon interurban electric railway lines, such rates of fare are already comparable with present fares prevailing in the United Kingdom.

Statistics recently (April, 1907) compiled in the office of the American Street and Interurban Association show that for 74 interurban railways, located in nineteen different states, the following averages prevail:

Population of larger terminal.....	133,900
Population of smaller terminal.....	37,200
Fare in cents per mile (one way).....	1.69
Fare in cents per mile (round trip).....	1.57

When it is considered that these interurban roads to a great extent run through sparsely settled districts, often extending several miles between the small villages, with little intervening popu-

lation, the comparison of these rates with those of the densely populated cities of the United Kingdom is certainly decidedly in favor of the American interurban railways.

As shown by the schedule of our experts, Messrs. Turner and James, the rate of fare averages over one cent per mile upon the combined municipally owned lines of Glasgow, Manchester, Liverpool and London County Council.

In considering this general proposition from the standpoint of public benefit, it must of course be admitted that with the graduated fare system the individual pays for what he gets. In other words, a portion of the fare of the passenger who rides a short distance does not go toward paying the expense of those passengers who ride distances so great that the expense of carrying them is larger than the fare they pay; but if viewed broadly, and considering benefits to communities as a whole, there is no question whatever, but what the flat fare rate in America has done much more for them than could have been accomplished in any other way, especially for the laboring classes; this through the distribution of the population over greater areas, thus improving sanitation, public health and morals, while enormous financial advantages have accrued to local treasuries because of the great increase in building and of real estate values.

It is a well recognized principle of government, and is incident to civilization, that a large portion of the citizens must bear a greater or less burden in some form of contribution to general welfare, from which they receive only indirect benefits. Probably no contribution of this character has ever been of such great public benefit as that portion of nickels paid by short riders on American tramways which has gone toward producing the inestimable advantages just above described.

It should not be considered that the universal American street railway fare, with its free transfers, and its effect on redistributing the population of congested cities has been unknown to the projectors of municipal tramways in the United Kingdom, for Board of Trade, London County Council and similar official publications reveal this fact; it has also been discussed in almost every British municipal body that is interested in tramways.

Apropos to this feature an extract from the report of the committee appointed by the Glasgow Corporation Tramways to examine and report on street railway traction and operation in American cities (1896), will be of interest.

"We were never prouder of Glasgow than when we heard of the high place assigned to her as a municipality by the Americans. But we have not served twenty years in the health department, and been acquainted with "Life in one Room," without knowing Glasgow's blemishes—and they are common to all our older cities. One great city improvement scheme has been carried out in our city, and another is now being favorably considered. In Glasgow, as it was five years ago, there was a population of 565,714 on an area of 6,111 acres, giving 92 persons to the acre or

58,880 to the square mile. In the present greater Glasgow, apart from the adjoining but still separate burghs, we have a population of 705,000 on an area of 12,311 acres, giving 57 persons to the acre or 36,480 to the square mile. When the four separate burghs now served by our tramway system are included, we have a population of 841,000 persons on an area of 14,661 acres, which also gives 57 to the acre or 36,480 to the square mile. No American city, with the exception of New York, is half so densely populated. No one wishes our citizens to continue so closely packed together as they now are. How are they to spread out? In our humble opinion and judging from what we have been privileged to see in America, the most powerful instrument which lies to the hand of the municipality for effecting this purpose is the best and cheapest possible tramway service radiating from the centre of the city outwards in every direction.

"Such a system must be safe, rapid, as far as consistent with safety, elastic as to speed, clean, comfortable and attractive, flexible enough to apply to all routes and meet all contingencies of street traffic and, of course, as cheap as possible; and it would be all the better if each route had its suburban attractions in the shape of a park for music and the usual facilities for amusement and recreation generally. As sure as you give cheap and rapid transit which will enable all sorts and conditions of people living at a distance to travel comfortably to and from their work in the city, so surely will houses to accommodate them be built on cheaper ground—meaning cheaper rents—and with healthier surroundings."

Wise as are the above recommendations, which resulted in the creation of the present electric tramway system of Glasgow, the very slight redistribution of population and lessening of its density which has followed the creation of the system, tells its own story as regards the effect of a graduated fare.

The schedule of the Commissions' experts, Messrs. Turner and James, contains much information concerning fares charged on the various British systems which they investigated. These are of little value for comparison with each other owing to the widely varying conditions existing in connection with the various projects. Such for instance, as contrasting Norwich, a small city, with either Glasgow, Manchester, Liverpool or London. Neither can comprehensive comparisons be made between the London United system, whose lines are suburban or interurban in their character, with those of the cities just mentioned.

However, for comparison with American conditions, the following tabulation has been compiled from the figures of Messrs. Turner and James on Glasgow, which has the lowest rates of fare of any municipal tramway in the kingdom:

Rates of fare in pence.	*Maximum distance in miles.*	*Passengers carried.*	*Possible length of rides in miles.*	*Passenger earnings.*
½	.58	58,540,026	33,953,215	£121,958
1	2.3	117,897,292	276,164,001	491,239
1½	3.48	13,100,122	45,588,424	81,876
2	4.59	3,648,195	16,745,219	30,402
2½	5.88	1,024,122	6,021,837	10,667
3	6.9	1,235,246	8,553,197	15,441
3½	8.11	241,241	1,956,464	3,518
4	9.19	81,249	746,678	1,354
	Total.....	195,767,519	389,700,935	£756,480

Analysis of the foregoing will show that the average possible length of ride available to passengers was 1.93 miles and the average fare to be paid therefore was 0.94 pence, and the longest ride available for the equivalent of a five cent fare (2½d.) is 5.88 miles.

Contrast this with conditions existing on certain American street railway systems. According to the records of the American Street and Interurban Railway Association, May 31, 1907:

Name of System.	*Longest ride for 5 cents without changing cars.*	*Longest ride possible for 5 cents through transfers.*
New York City Railway Co.....	12.37	37.2
Philadelphia Rapid Transit Co.....	14.24	26.13
Pittsburg Railways Co.....	10.5	14.1
United Railways of San Francisco.....	7.4	13.4
United Railways and Electric Co., Baltimore	10.6	17.3
United Railways Co., St. Louis.....	14.49	22.35
Washington Railway and Electric Co..	6.6	13.5

Owing to the grave inaccuracies in the accounting methods of municipal tramways, and the mischarging to other municipal accounts of large sums which should show in capital and operating accounts of their tramways, it is considered that the schedules of the committee's experts must be dismissed as being of little practical value so far as showing the true financial conditions and results from operating municipal tramways are concerned; because as already stated, they were not permitted to go behind the returns, so to speak, and see how the municipal figures had been made up and, as already stated, the general system of official audit is defective to the extreme.

In conclusion a word will be said regarding claims which are constantly made for the superior credit which British municipalities possess over public utility companies.

According to the quotations in the London Stock Exchange Daily Official List of May 16, 1907, the total number of municipal securities there quoted was 169. Of these

32 were quoted at par or above.
12 from 95 to 99 per cent.
25 from 90 to 94 per cent.
73 from 85 to 89 per cent.
15 from 80 to 84 per cent.
9 from 75 to 79 per cent.
3 from 70 to 74 per cent.

Under the law all of these were issued practically at par and as the aggregate of the issues is several hundred millions of dollars, it is seen at a glance that an enormous loss has fallen upon British investors because of their investment in municipal securities. An important feature involved in connection with the shrinkage in values of British municipal securities is the fact that the principal portion of sinking, reserve and renewal funds, which have been created in connection with the municipal tramways and are invested in this character of securities. So these funds are materially affected by the shrinkage. Commenting thereon the district auditor in his report on London County Council Tramways for year ending March 31, 1906, says:

"With reference to the sum of £83,008 16s. 2d., being the portion of the renewals reserve fund invested in £86,844 11s. 9d. 3 per cent. London County Consolidated stock, I may point out that the market value of this investment at March 31, 1906, was £80,765 9s. 3d."

A surprising revelation in connection with the quotations is that certain of the London County Council securities are selling as low as from 72 to 74 per cent.

Certain of Glasgow at from 77 to 79 per cent.

Certain of Liverpool at from 76 to 78 per cent.

Certain of Manchester at from 87 to 89 per cent.

Against this Dublin United Tramways Company's common shares were quoted at from 142 per cent. and a fraction to 152 per cent.

The preferred shares of the same company at from 135 to 145 per cent.

London United Tramways Company accumulative preferred stock was quoted at from 77½ to 87½ per cent.

The debentures of the same company at from 85 to 89 per cent.

No quotations were made on other tramway securities issued by the companies investigated by the Commission.

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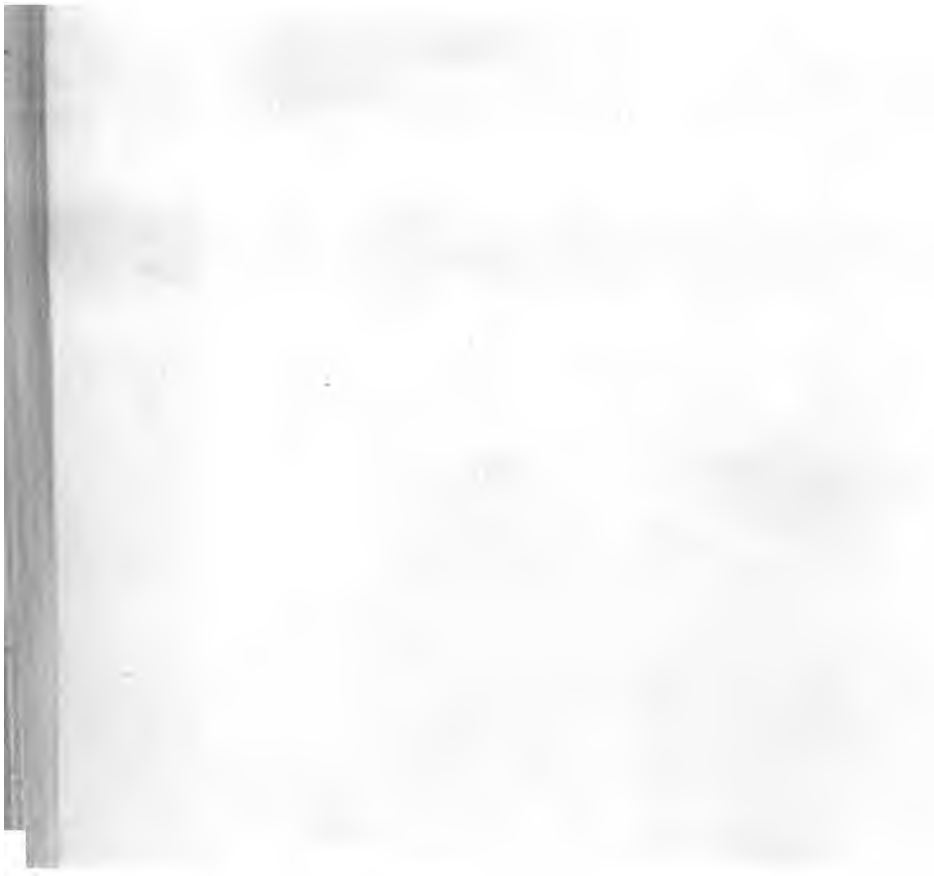

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